

DEPARTMENT OF THE INTERIOR

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Comprehensive Bibliographies on Primary and Supergene Ni-Cu-PGE
Mineralization Associated with Komatiitic and Mafic Intrusions
in Australasia, on Layered Mafic Intrusions in Australasia,
and on the Dufek Intrusion, Antarctica

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These bibliographies have been compiled at the U.S. Geological Survey, Menlo Park, California, under the auspices of Project 161 of the International Geological Correlation Program, entitled "Sulfide Deposits in Mafic and Ultramafic Rocks." Part of a series of bibliographies being compiled for the entire world, they are considered to be complete through 1986.

Compilation of the bibliographies was begun by searching the computerized data bases of scientific literature referred to as GeoRef (American Geological Institute) and CA Search (Chemical Abstracts), using two search strategies:

$A + (B \text{ or } C \text{ or } D \text{ or } E) + F$

or

$G + F$

where

- A = nickel or cobalt or platinum or pentlandite
- B = mineralization or ore deposit or dissemination or mine
- C = ultramafic or ultrabasic or dunite or peridotite or harzburgite
- D = gabbro or anorthosite or norite
- E = economic geology
- F = a geographic region, and
- G = layered intrusion or cumulate

Specifically excluded from the bibliography on mineralized occurrences are references relating to Ni, Cu, or Pt-group-element mineralization associated with other than mafic igneous rocks. References to mafic rocks considered to be ophiolitic in character are excluded from the bibliography on unmineralized layered mafic intrusions, as are references to innumerable occurrences of unmineralized noncumulate gabbroic rocks. The bibliography on unmineralized mafic intrusions complements that for known mineralization; it provides the researcher with contrast and the prospector with potential.

The bibliography on nickel deposits of Western Australian includes all relevant references cited in Geological Survey of Western Australia Mineral Resource Bulletin 14, "Nickel Mineralization in Western Australia," by R. J. Marston. This 271-page volume contains a wealth of information, including references to many unpublished reports which we do not cite here. Readers should also be aware that many unreferenced short articles are contained in University of Western Australia Geology Department and Extension Service Publication 7, "Regional geology and nickel deposits of the Norseman-Wiluna Belt, Western Australia," edited by D. I. Groves and C. M. Lesher for IGCP project 91 and 161 field conferences in 1982.

We thank the many individuals who helped make these bibliographies accurate and comprehensive. Especially noteworthy were the contributions of Mark Barley, University of Western Australia; D. Russel Hudson; A. L. Jaques; Charter Mathison; and Sue Thornett, B.H.P. Minerals, Perth.

Because large bibliographies on mafic intrusions in other parts of the world were being compiled concurrently, time has not been available for inspection and verification of many of the citations; for this we apologize. Users of these bibliographies are encouraged to report any errors to Gerald K. Czamanske so that they may be corrected. In a similar spirit, users are encouraged to send notice of any reports published before 1987 that have been inadvertently omitted. Consistency of citation style has benefited from review by George Havach of the U.S. Geological Survey. The efforts of Pauline C. Bennett during early stages of compilation are gratefully acknowledged.

This report is being issued in two forms, representing slightly differing versions. Version A, issued as paper copy, incorporates foreign diacritics. Version B, issued as an IBM-compatible diskette, affords users the great benefit of an online bibliography, but is formatted only in the standard ASCII character set.

BIBLIOGRAPHY ON WESTERN AUSTRALIAN Ni SULFIDE DEPOSITS

- Andrews, P. B., 1975, Spargoville nickel deposits, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea. I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 89-91.
- Anonymous, 1975, The Poseidon story: Western Australia's Cinderella nickel producer goes on-line with a 1 million-mtpy sulphide flotation concentrator one day ahead of schedule: Engineering and Mining Journal, v. 176, p. 53-62.
- 1978, Prospecting for nickel; Western Australia: Geological Survey of Western Australia Information Pamphlet 6, 20 p.
- 1969, The nickel finds around Kalgoorlie: Australian Mining, v. 61, no. 3, p. 59.
- Arndt, C. D., 1980, Carnilya Hill Ni-mineralization, Yilgarn Block, W.A.: Journal of Geochemical Exploration, v. 12, p. 171-173.
- Baker, M., and Dawson, P. E., 1980, Nickel ore mining at Redross, W.A., by Anaconda/CRA, in Woodcock, J. T., ed., Mining and metallurgical practices in Australasia: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 10, p. 559-560.
- Barker, W. W., Bussel, M., Fletcher, A. B., Hill, R. E., Hudson, D. R., Nickel, E. H., Ramsden, A. R., and Thornber, M. R., 1975, Nickel deposits: Australia: Commonwealth Scientific and Industrial Research Organization, Minerals Research Laboratories Annual Report 1974-75, p. 12-14.
- Barrett, F. M., Binns, R. A., Groves, D. I., Marston, R. J., and McQueen, K. G., 1977, Structural history and metamorphic modification of Archean volcanic-type nickel deposits, Yilgarn Block, Western Australia: Economic Geology, v. 72, p. 1195-1223.
- Barrett, F. M., Binns, R. A., Gunthorpe, R. J., McQueen, K. G., and Marston, R. J., 1976, Metamorphic modification of Archean nickel deposits, Western Australia: International Geological Congress, 25th, Sydney, 1976, Abstracts, v. 1, p. 111.
- Barrett, F. M., Groves, D. I., and Binns, R. A., 1976, Importance of metamorphic processes of the Nepean nickel deposit, Western Australia: London, Institution of Mining and Metallurgy Transactions, sec. B, v. 85, p. 252-273.
- Barry, J., 1974, Geochemistry of the Scotia nickel deposit in relation to exploration: Adelaide, South Australia, University of Adelaide, Ph.D. thesis, 99 p.
- Bavinton, O. A., 1979, Interflow sedimentary rocks from the Kambalda ultramafic sequence; their geochemistry, metamorphism and genesis: Canberra, New South Wales, Australian National University, Ph.D. thesis, 196 p.

- Bavinton, O. A., 1981, The nature of sulfidic metasediments at Kambalda and their broad relationships with associated ultramafic rocks and nickel ores: *Economic Geology*, v. 76, p. 1606-1628.
- Bavinton, O. A., and Keays, R. R., 1978, Precious metal values from interflow sedimentary rocks from the komatiite sequence at Kambalda, Western Australia: *Geochimica et Cosmochimica Acta*, v. 42, p. 1151-1163.
- Bayer, H., and Siemes, H., 1971, Zur Interpretation von Pyrrhotin-Gefügen: *Mineralium Deposita*, v. 6, p. 225-244.
- Bennett, C. E. G., Graham, J., Parks, T. C., and Thornber, M. R., 1972, New observations on natural pyrrhotites. Part II. Lamellar magnetite in monoclinic pyrrhotite: *American Mineralogist*, v. 57, p. 1876-1880.
- Bennett, C. E. G., Graham, J., and Thornber, M. R., 1972, New observations on natural pyrrhotites. Part I. Mineragraphic techniques: *American Mineralogist*, v. 57, p. 445-462.
- Besson, M., 1976, Le chimisme des roches ultrabasiques minéralisées en sulfures de nickel d'Australie occidentale: France, Bureau Recherches Géologiques et Minières Bulletin, ser. 2, sec. 2, no. 2, p. 185-213.
- Besson, M., Meyer, G., and Treuil, M., 1980, Approche géochimique; Caractérisation et discrimination géochimiques des ensembles favorables et défavorables; VI, Eléments traces et terres rares dans quelques métapicrites d'Australie occidentale [Geochemical approach; geochemical characterization and discrimination of favorable and unfavorable complexes; VI. Trace elements and rare earths in Western Australian metapicrites]: France, Bureau de Recherches Géologiques et Minières Memoir 97, p. 159-166.
- Billington, L. G., 1984, Geological review of the Agnew nickel deposit, Western Australia, *in* Buchanan, D. L., and Jones, M. J., eds., Sulfide deposits in mafic and ultramafic rocks: London, Institution of Mining and Metallurgy, p. 43-54.
- Binns, R. A., and Champness, P. E., 1985, Analytical electron microscope study of red-brown olivines in ultramafic rocks from the Yilgarn Block, W. A., *in* Morris, R. C., and others, eds., Research review 1985: Canberra, New South Wales, CSIRO Division of Mineralogy and Geochemistry, p. 32-33.
- Binns, R. A., and Groves, D. I., 1976, Iron-nickel partition in metamorphosed olivine-sulfide assemblages from Perseverance, Western Australia: *American Mineralogist*, v. 61, p. 782-787.
- Binns, R. A., Groves, D. I., and Gunthorpe, R. J., 1977, Nickel sulphides in Archaean ultramafic rocks of Western Australia, *in* Sidorenko, A. V., ed., Correlation of the Precambrian (Korrelyatsiya dokembriya): Moscow, Nauka, v. 2, p. 349-380.
- Binns, R. A., Gunthorpe, R. J., and Groves, D. I., 1976, Metamorphic patterns and development of greenstone belts in the eastern Yilgarn Block, Western Australia, *in* Windley, B. F., ed., The early history of the Earth: London, Wiley and Sons, p. 303-313.
- Binns, R. A., and Marston, R. J., 1976, Archaean geology of the Yilgarn Block, Western Australia: International Geological Congress, 25th, Sydney, 1976, Excursion Guide 40A, 73 p.

Blockley, J. G., 1972, A reported platinum find in the Rudall River area: Perth, Western Australia Department of Mines Report 1971, p. 103-104.

Bunting, J. A., and Williams, S. J., 1979, Sir Samuel, W. A.: Geological Survey of Western Australia, 1:250,000 Geological Explanation Notes, 40 p.

Burt, D. R. L., and Sheppy, N. R., 1975, Mount Keith nickel sulphide deposit, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea. I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 159-168.

Butt, C. R. M., and Sheppy, N. R., 1975, Geochemical exploration problems in Western Australia exemplified by the Mt. Keith area, in Elliott, I. L., and Fletcher, W. K., eds., Geochemical exploration 1974: Amsterdam, Elsevier, p. 391-415.

Campbell, I. H., and Maldrett, A. J., 1979, The influence of silicate:sulfide ratios on the geochemistry of magmatic sulfides: Economic Geology, v. 74, p. 1503-1505.

Carr, S. G., 1974, The geology of the Sherlock Bay copper-nickel deposits, Pilbara, W.A.: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 25 p.

Cassidy, K. F., 1985, Compositions of magmatic ilmenites: Petrogenetic indicators of parent magma composition: Nedlands, University of Western Australia, B.Sc. Honours thesis, 89 p.

Cech, F., 1977, Exkurze na rudni loziska zapadni a jizni casti Australie [Excursion to the ore deposits of southern and Western Australia]: Vestnik Ustredniho Ustavu Geologickeha, v. 52, no. 4, p. 217-223.

Chapman, D. G., and Groves, D. I., 1979, A preliminary study of the distribution of gold in Archaean interflow sulphidic metasediments, Yilgarn Block, Western Australia, in Glover, J. E., and Groves, D. I., eds., Gold mineralization: Nedlands, University of Western Australia, Geology Department and Extension Service Publication 3, p. 76-88.

Christensen, S. M., 1981, Geochemical parameters of base-metal sulphide-bearing volcano-sedimentary environments, Western Australia: Chemical Geology, v. 31, p. 285-301.

Christie, D., 1975, Scotia nickel sulphide deposit, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 121-125.

Cooper, J. A., Nesbitt, R. W., Platt, J. P., and Mortimer, G. E., 1978, Crustal development in the Agnew region, Western Australia, as shown by Rb/Sr isotopic and geochemical studies: Precambrian Research, v. 7, p. 31-59.

Cornelius, M., and Stumpfl, E. F., 1986, Platinum mineralization in mafic-ultramafic rocks, Western Gneiss Terrain, W. Australia: International Mineralogical Association General Meeting, 14th, Stanford, Calif., 1986, Abstracts with Program, p. 81-82.

Cowden, Alistair, 1985, The effects of metamorphism upon the mineralogy, textures and geochemistry of the Kambalda nickel ores: Canadian Mineralogist, v. 23, p. 325.

Cowden, Alistair, and Archibald, N. J., 1987, Massive-sulfide fabrics at Kambalda and their relevance to the inferred stability of monosulfide solid-solution: Canadian Mineralogist, v. 25, p. 37-50.

Cowden, Alistair, Donaldson, M. J., Naldrett, A. J., and Campbell, I. H., 1985, Platinum-group elements in the komatiite-hosted Fe-Ni-Cu sulfide deposits at Kambalda, Western Australia: Canadian Mineralogist, v. 23, p. 300.

----- 1986, Platinum-group elements and gold in the komatiite-hosted Fe-Ni-Cu sulfide deposits at Kambalda, Western Australia: Economic Geology, v. 81, p. 1226-1235.

Cowden, Alistair, and Woolrich, Paul, 1985, Geochemistry of the Kambalda iron-nickel sulfides: Implications for sulfide-silicate partitioning models: Canadian Mineralogist, v. 23, p. 325.

----- 1987, Geochemistry of the Kambalda iron-nickel sulfides: Implications for models of sulfide-silicate partitioning: Canadian Mineralogist, v. 25, p. 21-36.

Cox, R., and Tyrwhitt, D. S., 1975, Pioneer nickel prospects, near Norseman, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 79-81.

Cruickshank, A. C., 1980, Nickel ore mining by Western Mining Corporation Ltd. at Scotia and Carr Boyd Rocks, W.A., in Woodcock, J. T., ed., Mining and metallurgical practices in Australasia: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 10, p. 567-569.

Dalgarno, C. R., 1972, Geochemistry of the Redross nickel prospect, Widgiemooltha area, Western Australia: Geological Society of Australia Joint Specialist Groups Meetings, Canberra, 1972, Proceedings, p. B12-B14.

----- 1975, Nickel deposits of the Widgiemooltha dome--Redross, Wannaway, Widgiemooltha, Dordie, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 82-86.

Davidson, J. E., 1970, A petrological and geochemical study of three diamond-drill holes through the Mt. Windarra ultramafics and zone of mineralization: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 44 p.

Davis, G. J., 1972, Geology of the North Range, Koolyanobbing, Western Australia: Nedlands, University of Western Australia, B.Sc. Honours thesis, 85 p.

Davy, R., Marston, R. J., and Dodd, C. J., 1981, Mercury in some Western Australian mineralized rocks: Perth, Western Australia Department of Mines Annual Report 1980, p. 139-142.

Donaldson, M. J., 1974, Petrology of the Munni Munni complex, Roebourne, Western Australia: Geological Society of Australia Journal, v. 21, p. 1-16.

----- 1980, Magmatic features and metamorphism of some Archaean dunites, Western Australia: International Geological Congress, 26th, Paris, 1980, Abstracts, v. 1, p. 38.

Donaldson, M. J., 1980, The behaviour of nickel during metamorphism of some Archaean dunites, Western Australia: International Archaean Symposium, 2nd, Perth, 1980, Abstracts, v. 1, p. 62-64.

----- 1981, Redistribution of ore elements during serpentinization and talc-carbonate alteration of some Archean dunites, Western Australia: Economic Geology, v. 76, p. 1698-1713.

----- 1983, Progressive alteration of barren and weakly mineralized Archean dunites: A petrological, mineralogical and geochemical study of some intrusive dunites from Western Australia: Nedlands, University of Western Australia, Ph.D. thesis, 345 p.

Donaldson, M. J., and Bromley, G. J., 1981, The Honeymoon Well nickel sulfide deposits, Western Australia: Economic Geology, v. 76, p. 1550-1564.

Donaldson, M. J., and Groves, D. I., 1985, The relevance of chromite as a petrogenetic indicator in metamorphosed komatiitic rocks and associated Ni ores: Canadian Mineralogist, v. 23, p. 326.

Donaldson, M. J., Leshner, C. M., and Groves, D. I., 1986, Comparison of Archaean dunites and komatiites associated with nickel mineralization in Western Australia: Implications for dunite genesis: Mineralium Deposita, v. 21, p. 296-305.

Donnelly, T. H., Lambert, I. B., Oehler, D. Z., Hallberg, J. A., Hudson, D. R., Smith, J. W., Bavington, O. A., and Golding, L., 1978, A reconnaissance study of stable isotope ratios in Archaean rocks from the Yilgarn Block, Western Australia: Geological Society of Australia Journal, v. 24, p. 409-420.

Drake, J. R., 1972, The structure and petrology of banded iron formations at Mount Windarra, Western Australia: Nedlands, University of Western Australia, B.Sc. Honours thesis, 93 p.

Duke, J. M., 1979, Computer simulation of the fractionation of olivine and sulfide from mafic and ultramafic magmas: Canadian Mineralogist, v. 17, p. 507-514.

Duke, J. M., and Naldrett, A. J., 1978, A numerical model of the fractionation of olivine and molten sulfide from komatiite magma: Earth and Planetary Science Letters, v. 39, p. 255-266.

Eckstrand, O. R., 1973, Visit to Australia nickel sulphide deposits yields impressions, inferences for Canada: Northern Miner, Nov. 1973, p. 64.

----- 1974, Significance of some Australian and African occurrences for Canadian Archean nickel deposits, in Report of activities, Part A, April to October 1973, Mineral deposits: Ottawa, Geological Survey of Canada Paper 74-1, p. 133-134.

Ewers, W. E., 1972, Nickel-iron exchange in pyrrhotite: Australasian Institute of Mining and Metallurgy Proceedings, no. 241, p. 19-26.

Ewers, W. E., Graham, J., Hudson, D. R., and Rolls, J. M., 1976, Crystallization of chromite from nickel-iron sulphide melts: Contributions to Mineralogy and Petrology, v. 54, p. 61-64.

Ewers, W. E., and Hudson, D. R., 1972, An interpretive study of a nickel-iron sulfide ore intersection, Lunnon shoot, Kambalda, Western Australia: *Economic Geology*, v. 67, p. 1075-1092.

Fardon, R. S. H., 1971, The Western Australian nickel deposits, in Glover, J. E., ed., *Symposium on Archaean Rocks*, Perth, 1970, *Proceedings: Geological Society of Australia Special Publication 3*, p. 256.

Fisher, D., 1979, The petrology of the Mt. Edwards nickel sulphide deposit, Widgiemooltha, Western Australia: Toronto, Ontario, University of Toronto, Ph.D. thesis [available at National Library of Canada, Ottawa, Canada].

Frost, K. M., 1985, Ocellar komatiites at Kambalda, Western Australia: Evidence of silicate liquid immiscibility and sediment assimilation: Nedlands, University of Western Australia, B.Sc. Honours thesis, 109 p.

Gee, C. E., and Reichman, J. P., 1973, Computer assisted ore reserve calculations at Western Mining Corporation Ltd.'s Kambalda nickel operations, in Western Australia Conference, 1973, *Papers: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Conference Series*, no. 2, p. 355-362.

Gee, R. D., 1975, Regional geology of the Archaean nuclei of the Western Australia Shield, in Knight, C. L., ed., *Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series*, no. 5, p. 43-55.

----- 1979, Structure and tectonic style of the Western Australian Shield: *Tectonophysics*, v. 58, p. 327-369.

Gee, R. D., Groves, D. I., and Fletcher, C. I., 1976, Archaean geology of mineral deposits of the Eastern Goldfields: *International Geological Congress, 25th, Sydney, 1976, Excursion Guide 42A*, 56 p.

Gemuts, I., 1975, Miriam nickel prospect, Coolgardie area, in Knight, C. L., ed., *Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series*, no. 5, p. 98-99.

Gemuts, I., and Theron, A., 1975, The Archaean between Coolgardie and Norseman; stratigraphy and mineralization, in Knight, C. L., ed., *Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series*, no. 5, p. 66-74.

Gole, M. J., and Hill, R. E. T., 1985, Metamorphism at the Agnew nickel mine--preliminary data from the ultramafic rocks, in Morris, R. C., and others, eds., *Research review 1985: Canberra, New South Wales, CSIRO Division of Mineralogy and Geochemistry*, p. 30-31.

Graindorge, J. M., 1974, Geology and genesis of the Sherlock Bay nickel-copper mineralisation, West Pilbara region, Western Australia: Nedlands, University of Western Australia, B.Sc. Honours thesis, 137 p.

Green, A. H., and Naldrett, A. J., 1981, The Langmuir volcanic peridotite-associated nickel deposits: Canadian equivalents of the Western Australian occurrences: *Economic Geology*, v. 76, p. 1503-1523.

Gresham, J. J., 1986, Depositional environments of volcanic peridotite-associated nickel sulphide deposits with special reference to the Kambalda Dome, in Friedrich, G. H., and others, eds., *Geology and metallogeny of copper deposits*: Berlin, Springer-Verlag, p. 63-90.

Gresham, J. J., and Loftus-Hills, G. D., 1981, The geology of the Kambalda nickel field, Western Australia: *Economic Geology*, v. 76, p. 1373-1416.

Groves, D. I., 1978, Effects of serpentinization and talc-carbonatization on disseminated nickel deposits, Western Australia, in Evans, A. M., compiler, *Mineral deposits genesis*, Sheffield, U.K., Dec. 10-14, 1977: London, Institution of Mining and Metallurgy Transactions, sec. B, v. 87, p. 34.

----- 1982, Sulfide nickel-copper deposits of Western Australia: Geology, exploration and evaluation, in Sidorenko, A. V., and Kazanskiy, V. I., eds., *Mineral'nyye mestorozhdeniya dokembriya* [Precambrian mineral deposits]: *Problemy osadochnoy geologii Dokembriya* [Problems of the sedimentary geology of the Precambrian], v. 8, p. 99-125 [IGCP Project 91].

----- 1982, Sulphide nickel-copper deposits of Western Australia: Geology, exploration and evaluation, in United Nations, *The development potential of Precambrian mineral deposits*: New York, Pergamon, p. 267-306.

----- 1982, The Archaean and earliest Proterozoic evolution and metallogeny of Australia: *Revista Brasileira de Geociencias*, v. 12, p. 135-148.

Groves, D. I., Barrett, F. M., Binns, R. A., and Marston, R. J., and McQueen, K. G., 1976, A possible volcanic-exhalative origin for lenticular nickel sulfide deposits of volcanic association, with special reference to those in Western Australia: Discussion: *Canadian Journal of Earth Science*, v. 13, p. 1646-1650.

Groves, D. I., Barrett, F. M., Binns, R. A., and McQueen, K. G., 1977, Spinel phases associated with metamorphosed volcanic-type iron-nickel sulfide ores from Western Australia: *Economic Geology*, v. 72, p. 1224-1244.

Groves, D. I., Barrett, F. M., and McQueen, K. G., 1978, Geochemistry and origin of cherty metasediments within ultramafic flow sequences and their relationship to nickel mineralization, in Glover, J. E., and Groves, D. I., eds., *Archaean cherty metasediments: Their sedimentology, micropalaeontology, biogeochemistry, and significance to mineralization*: Nedlands, University of Western Australia, Geology Department and Extension Service Publication 2, p. 57-69.

----- 1979, The relative roles of magmatic segregation, volcanic exhalation and regional metamorphism in the generation of volcanic-associated nickel ores of Western Australia: *Canadian Mineralogist*, v. 17, p. 319-336.

Groves, D. I., and Batt, W. D., 1984, Controls on the heterogeneous distribution of metallogenic associations in Archaean greenstone belts with particular reference to the Western Australian Shield: *International Geological Congress, 27th, Moscow, 1984, Proceedings*, v. 5, p. 315-335.

----- 1984, Spatial and temporal variations of Archaean metallogenic associations in terms of evolution of granitoid-greenstone terrains with special emphasis on the Western Australian Shield, in Kroner, A., Hanson, G. N., and Goodwin, A. M., eds., *Archaean geochemistry*: Berlin, Springer-Verlag, p. 73-98.

Groves, D. I., Binns, R. A., Barrett, F. M., and McQueen, K. G., 1975, Sphalerite compositions from Western Australian nickel deposits, a guide to equilibria below 300 degrees C: *Economic Geology*, v. 70, p. 391-396.

Groves, D. I., and Gee, R. D., 1980, Regional geology and mineral deposits of the Kalgoorlie-Norseman region: *International Archaean Symposium*, 2nd, Perth, 1980, Excursion Guide, 112 p.

Groves, D. I., and Hudson, D. R., 1981, The nature and origin of Archaean stratabound volcanic-associated nickel-iron-copper sulphide deposits, chap. 6 of Wolf, K. H., ed., *Handbook of strata-bound and stratiform ore deposits*: Amsterdam, Elsevier, v. 9, p. 305-410.

Groves, D. I., Hudson, D. R., and Hack, T. B. C., 1974, Modification of iron-nickel sulfides during serpentinization and talc-carbonate alteration at Black Swan, Western Australia: *Economic Geology*, v. 69, p. 1265-1281.

Groves, D. I., Hudson, D. R., Marston, R. J., and Ross, J. R., eds., 1981, Nickel deposits and their host rocks in Western Australia: *Economic Geology*, v. 76, p. 1289-1816.

Groves, D. I., and Keays, R. R., 1979, Mobilization of ore-forming elements during alteration of dunites, Mt. Keith-Betheno, Western Australia: *Canadian Mineralogist*, v. 17, p. 373-389.

Groves, D. I., Korkiakoski, E. A., McNaughton, N. J., Leshner, C. M., and Cowden, Alistair, 1986, Thermal erosion by komatiites at Kambalda, Western Australia and the genesis of nickel ores: *Nature*, v. 319, p. 136-138.

Groves, D. I., and Leshner, C. M., eds., 1982, Regional geology and nickel deposits of the Norseman-Wiluna Belt, Western Australia: *Nedlands, University of Western Australia, Geology Department and Extension Service Publication 7*, 232 p.

Groves, D. I., Leshner, C. M., and Gee, R. D., 1984, Tectonic setting of the sulphide nickel deposits of the Western Australia Shield, in Buchanan, D. L., and Jones, M. J., eds., *Sulfide deposits in mafic and ultramafic rocks*: London, Institution of Mining and Metallurgy, p. 1-13.

Hall, J. S., 1971, A comparative biogeochemical investigation in the semi-arid/arid zone of Western Australia: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 23 p.

Hall, J. S., Both, R. A., and Smith, F. A., 1973, A comparative study of rock, soil and plant chemistry in relation to nickel mineralization in the Pioneer area, Western Australia: *Australasian Institute of Mining and Metallurgy Proceedings*, no. 247, p. 11-22.

Hallberg, J. A., 1970, The petrology and geochemistry of metamorphosed Archaean basic volcanic rocks between Coolgardie and Norseman, Western Australia: *Nedlands, University of Western Australia, Ph.D. thesis*, 191 p.

----- 1972, Geochemistry of Archaean volcanic belts in the Eastern Goldfields region of Western Australia: *Journal of Petrology*, v. 13, p. 45-56.

Hallberg, J. A., Hudson, D. R., and Gemuts, I., 1973, An Archaean nickel sulphide occurrence at Miriam, Western Australia, in *Western Australian Conference, 1973, Papers*: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Conference Series, no. 2, p. 121-128.

Halligan, R., and Harris, J. L., 1980, Bow River Cu-Ni deposit, Halls Creek Province, W.A.: *Journal of Geochemical Exploration*, v. 12, p. 214-217.

Hancock, W., Ramsden, A. R., Taylor, G. F., and Wilmshurst, J. R., 1971, Some ultramafic rocks of the Spargoville area, Western Australia, *in* Glover, J. E., ed., *Symposium on Archaean Rocks*, Perth, 1970, *Proceedings: Geological Society of Australia Special Publication 3*, p. 269-280.

Harrison, P. H., 1986, The mineral potential of layered igneous complexes within the Western Gneiss Terrain, *in* *Professional papers for 1984: Geological Survey of Western Australia Report 19*, p. 37-54.

Hill, R. E. T., 1983, An unusual intergrowth of chalcopyrite and Fe-Ni sulfides from Yakabindie, Western Australia, *in* Ewers, W. E., ed., *Research review 1983: Canberra, New South Wales, CSIRO Division of Mineralogy*, p. 59-61.

----- 1983, Calculated primary Ni/Cu ratios of disseminated sulfides from intrusive-dunite associated nickel deposits and their genetic significance, *in* Ewers, W. E., ed., *Research review 1983: Canberra, New South Wales, CSIRO Division of Mineralogy*, p. 53-55.

----- 1983, Phase relationships in a portion of the Fe-Ni-Cu-S system which have application to the study of natural nickel-copper ores, *in* Ewers, W. E., ed., *Research review 1983: Canberra, New South Wales, CSIRO Division of Mineralogy*, p. 55-57.

----- 1983, The Six Mile Well nickel deposit--a layered ultramafic complex, *in* Ewers, W. E., ed., *Research review 1983: Canberra, New South Wales, CSIRO Division of Mineralogy*, p. 45-47.

Hill, R. E. T., and Gole, M. J., 1985, Characteristics of centres of Archaean komatiitic volcanism in the Agnew-Wiluna greenstone belt, Western Australia, *in* Morris, R. C., and others, eds., *Research review 1985: Canberra, New South Wales, CSIRO Division of Mineralogy and Geochemistry*, p. 29-30.

Hill, R. E. T., Gole, M. J., and Thompson, J. F. H., 1985, Characteristics of centres of Archean komatiitic volcanism, exemplified by lithologies in the Agnew area, Yilgarn Block, Western Australia: *Canadian Mineralogist*, v. 23, p. 327.

Hoatson, D. M., 1984, Potential for platinum-group mineralization in Australia; a review: *Australia Bureau of Mineral Resources Record 1984/1*, 92 p. -- Review of PGE-deposit models, occurrences of PGE in Australia, along with possibly associated Cr and V occurrences. Brief descriptions of various layered intrusions throughout Australia. -- J. A. B.

Hopwood, T. P., 1981, The significance of pyritic black shales in the genesis of Archaean massive nickel sulphide deposits, chap. 7 *of* Wolfe, K. H., ed., *Handbook of strata-bound and stratiform ore deposits: Amsterdam, Elsevier*, v. 9, p. 411-467.

Hough, M. J., 1976, Archaean ultramafic metavolcanics, host to nickel sulphide mineralization, Mt. Edwards, Western Australia: *Canberra, New South Wales, Australian National University, Ph.D. thesis*, 223 p.

Hudson, D. R., 1972, Evaluation of genetic models for Australian sulphide nickel deposits, in Newcastle Conference, 1972, Papers: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Conference Series, no. 1, p. 59-68.

----- 1973, Genesis of Archaean ultramafic-associated nickel-iron sulphides at Nepean, Western Australia, in Western Australian Conference, 1973, Papers: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Conference Series, no. 2, p. 99-109.

----- 1985, Distribution of sperrylite, sudburyite and other platinum group minerals in the Kambalda nickel deposits, Western Australia, in Morris, R. C., and others, eds., Research review 1985: Canberra, New South Wales, CSIRO Division of Mineralogy and Geochemistry, p. 78-79.

----- 1985, Platinum-group minerals from the Kambalda nickel deposits, Western Australia: Canadian Mineralogist, v. 23, p. 305.

----- 1986, Platinum metals in Australia--general occurrence and mineralogy and recovery from Western Australian nickel deposits: International Mineralogical Association General Meeting, 14th, Stanford, Calif., 1986, Abstracts with Program, p. 130.

----- 1986, Platinum-group minerals from the Kambalda nickel deposits, Western Australia: Economic Geology, v. 81, p. 1218-1225.

Hudson, D. R., and Donaldson, M. J., 1983, Mineralogy of platinum group elements in the Kambalda nickel deposits, Western Australia, in Ewers, W. E., ed., Research review 1983: Canberra, New South Wales, CSIRO Division of Mineralogy, p. 50-52.

----- 1984, Mineralogy of platinum group elements in the Kambalda nickel deposits, Western Australia, in Buchanan, D. L., and Jones, M. J., eds., Sulfide deposits in mafic and ultramafic rocks: London, Institution of Mining and Metallurgy, p. 55-61.

Hudson, D. R., and Groves, D. I., 1974, The composition of violarite coexisting with vaesite, pyrite, and millerite: Economic Geology, v. 69, p. 1335-1340.

Hudson, D. R., and Horwitz, R. C., 1985, Mineralogy and geological setting of a new occurrence of platinum-group minerals between Roebourne and Karratha, Western Australia, in Morris, R. C., and others, eds., Research review 1985: Canberra, New South Wales, CSIRO Division of Mineralogy and Geochemistry, p. 79-80.

Hudson, D. R., Robinson, B. W., Vigers, R. B. W., and Travis, G. A., 1978, Zoned michenerite-testibiopalladite from Kambalda, Western Australia: Canadian Mineralogist, v. 16, p. 121-126.

Hudson, D. R., and Travis, G. A., 1981, A native nickel-heazlewoodite-ferroan trevorite assemblage from Mount Clifford, Western Australia: Economic Geology, v. 76, p. 1686-1697.

INAL Staff, 1975, BHP/INAL nickel sulphide occurrences of the Widgiemooltha area, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining Metallurgy Monograph Series, no. 5, p. 86-89.

Jacobson, E. P., 1971, A structural interpretation of a gravity and magnetic survey over greenstone rocks at Mt. Windarra in W.A.: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 32 p.

Joppek, P. E. R., 1975, The geology and geochemistry of rocks associated with nickel sulphide mineralization at Munda, Western Australia: Nedlands, University of Western Australia, B.Sc. Honours thesis, 62 p.

Just, J., 1976, Mineragraphy in beneficiation of Western Australian nickel ores: International Geological Congress, 25th, Sydney, 1976, Abstracts, v. 2, p. 576-577.

Kazanskiy, V. I., 1978, Evolyutsiya tektonicheskikh struktur i yendogennoye orudneniye drevnikh shchitov [The evolution of tectonic structures and endogene mineralization of ancient shields], in Endogennoye orudneniye drevnikh shchitov (evolyutsiya, strukturnyye i petrologicheskiye usloviya rudobrazovaniya): Moscow, Nauka, p. 7-31 [IGCP Project 9].

Keays, R. R., 1979, Gold deposits and ultramafic rocks; the link with nickel sulphide deposits: Geological Association of Canada-Mineralogical Association of Canada Joint Annual Meeting, Program with Abstracts, p. 60.

----- 1980, The use of precious metals in the evaluation of genetic models for nickel sulphide deposits: International Geological Congress, 26th, Paris, 1980, Abstracts, v. 3, p. 952.

Keays, R. R., and Campbell, I. H., 1981, Precious metals in the Jimberlana Intrusion, Western Australia: Implications for the genesis of platiniferous ores in layered intrusions: Economic Geology, v. 76, p. 1118-1141.

Keays, R. R., and Davison, R. M., 1976, Palladium, iridium, and gold in the ores and host rocks of nickel sulfide deposits in Western Australia: Economic Geology, v. 71, p. 1214-1228.

Keays, R. R., Nickel, E. H., Groves, D. I., and McGoldrick, P. J., 1982, Iridium and palladium as discriminants of volcanic-exhalative, hydrothermal, and magmatic nickel sulfide mineralization: Economic Geology, v. 77, p. 1535-1537.

Keays, R. R., Ross, J. R., and Woolrich, P., 1981, Precious metals in volcanic peridotite-associated nickel sulfide deposits in Western Australia. II: Distribution within the ores and host rocks at Kambalda: Economic Geology, v. 76, p. 1645-1674.

Keele, R. A., and Nickel, E. H., 1974, The geology of a primary millerite-bearing sulfide assemblage and supergene alteration at the Otter shoot, Kambalda, Western Australia: Economic Geology, v. 69, p. 1102-1117 [also see discussion and reply, Economic Geology, v. 70, p. 1127-1129].

Keeley, G. J., 1974, The geology of the Copper Pit horizon, Ruth Well area, West Pilbara Goldfield, Western Australia: Nedlands, University of Western Australia, B.Sc. Honours thesis, 71 p.

Knight, C. L., 1975, The nickel sulphide province of the Yilgarn Block; an introduction, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 65.

Korkiakoski, E. A., 1985, The nature of spinifex-textured Fe-Ni-Cu sulphide ores at Kambalda, Western Australia: Evidence for a magmatic origin and thermal erosion by komatiites: Nedlands, University of Western Australia, Geology Department research report, 112 p.

Lambert, I. B., Donnelley, T. H., Dunlop, J. S. W., and Groves, D. I., 1979, Stable isotope studies of early Archean sulphate deposits of probable evaporitic and volcanogenic origins: *Nature*, v. 276, p. 808-811.

Lambert, I. B., and Groves, D. I., 1981, Early Earth history and metallogeny, chap. 2 of Wolf, K. H., ed., *Handbook of strata-bound and stratiform ore deposits*: Elsevier, Amsterdam, v. 8, p. 339-447.

Lawn, A. M., 1977, Structure and metamorphism at Forrestania, Western Australia: Melbourne, Victoria, University of Melbourne, B.Sc. Honours thesis, 51 p.

Leahey, J. E., 1973, The geology and nickel-copper mineralogy of the D shoot, Mount Windarra, Western Australia: Hobart, University of Tasmania, B.Sc. Honours thesis, 102 p.

Legge, P. J., 1975, Weebo Bore nickel prospect, in Knight, C. L., ed., *Economic geology of Australia and Papua New Guinea, I. Metals*: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 147-148.

Leggo, M. D., and McKay, K. G., 1980, Forrestania nickel deposits, Yilgarn Block, W.A.: *Journal of Geochemical Exploration*, v. 12, p. 178-183.

Leshner, C. M., 1981, Concomitant tholeiitic and komatiitic volcanism as an ore-localizing mechanism at Kambalda, Western Australia: Geological Society of Australia, Australian Geological Convention, 5th, Abstracts, no. 3, p. 74-75.

----- 1983, Localization and genesis of komatiite-associated Fe-Ni-Cu sulphide mineralization at Kambalda, Western Australia: Nedlands, University of Western Australia, Ph.D. thesis, 318 p.

Leshner, C. M., Arndt, N. T., and Groves, D. I., 1984, Genesis of komatiite-associated nickel sulphide deposits at Kambalda, Western Australia: A distal volcanic model, in Buchanan, D. L., and Jones, M. J., eds., *Sulfide deposits in mafic and ultramafic rocks*: London, Institution of Mining and Metallurgy, p. 70-80.

Leshner, C. M., and Groves, D. I., 1984, Geochemical and mineralogical criteria for the identification of mineralized komatiites in Archaean greenstone belts of Australia: International Geological Congress, 27th, Moscow, 1984, *Proceedings*, v. 9, p. 283-302.

----- 1986, Controls on the formation of komatiite-associated nickel-copper sulfide deposits, in Friedrich, G. H., and others, eds., *Geology and metallogeny of copper deposits*: Berlin, Springer-Verlag, p. 43-62.

Leshner, C. M., and Keays, R. R., 1984, Metamorphically and hydrothermally mobilized Fe-Ni-Cu sulphides at Kambalda, Western Australia, in Buchanan, D. L., and Jones, M. J., eds., *Sulfide deposits in mafic and ultramafic rocks*: London, Institution of Mining and Metallurgy, p. 62-69.

Leshner, C. M., Lee, R. F., Groves, D. I., Bickle, M. J., and Donaldson, M. J., 1981, Geochemistry of komatiites from Kambalda, Western Australia: I. Chalcophile element depletion--a consequence of sulfide liquid separation from komatiitic magmas: *Economic Geology*, v. 76, p. 1714-1728.

Liddy, J. C., 1972, Ultrabasic-basic nickel mineralisation: *Australian Mining*, v. 64, no. 9, p. 54-63.

Lipscombe, D., 1972, Situation report from Western Australia; nickel developments center on flash smelter at Kalgoorlie, exploration at Agnew: *Engineering and Mining Journal*, v. 173, no. 7, p. 88-91.

Lusk, J., 1976, A possible volcanic-exhalative origin for lenticular nickel sulfide deposits of volcanic association, with special reference to those in Western Australia: *Canadian Journal of Earth Science*, v. 13, p. 451-458 [see also discussion and reply, v. 13, 1646-1653].

Marston, R. J., 1979, Copper mineralization in Western Australia: Perth, Geological Survey of Western Australia Mineral Resources Bulletin 13, 208 p.

----- 1984, Nickel mineralization in Western Australia: Perth, Geological Survey of Western Australia Mineral Resources Bulletin 14, 271 p.

Marston, R. J., and Groves, D. I., 1981, The metallogenesis of Archaean base-metal deposits in Western Australia, in Glover, J. E., and Groves, D. I., eds., *Archaean geology: Geological Society of Australia Special Publication 7*, p. 409-420.

Marston, R. J., Groves, D. I., Hudson, D. R., and Ross, J. R., 1981, Nickel sulfide deposits in Western Australia: A review: *Economic Geology*, v. 76, p. 1330-1363.

Marston, R. J., and Kay, B. D., 1980, The distribution, petrology, and genesis of nickel ores at the Juan complex, Kambalda, Western Australia: *Economic Geology*, v. 75, p. 546-565.

Martin, J. E., and Allchurch, P. D., 1973, Geology of Perseverance nickel deposit, Western Australia, in Western Australia Conference, 1973, Papers: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Conference Series, no. 2, p. 93.

----- 1975, Perseverance nickel deposit, Agnew, in Knight, C. L., ed., *Economic geology of Australia and Papua New Guinea, I. Metals*: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 149-155.

----- 1976, Sampling of the Perseverance nickel deposit, in Sampling practices in the mineral industries, Melbourne Branch Symposium, 1976, Papers: Parkville, Victoria, Australasian Institute of Mining and Metallurgy, p. 63-70.

Mathison, C. I., and Marshall, A. E., 1981, Ni-Cu sulfides and their host mafic-ultramafic rocks in the Mt. Sholl intrusion, Pilbara region, Western Australia: *Economic Geology*, v. 76, p. 1581-1596.

Mazzucchelli, R. H., 1972, Secondary geochemical dispersion patterns associated with the nickel sulphide deposits at Kambalda, Western Australia: *Journal of Geochemical Exploration*, v. 1, p. 103-116.

McCall, G. J. H., 1969, The Archaean succession to the west of Lake Lefroy: Royal Society of Western Australia Journal, v. 52, p. 119-128.

----- 1971, Some ultrabasic and basic igneous rock occurrences in the Archaean of Western Australia, in Glover, J. E., ed., Symposium on Archaean Rocks, Perth, 1970, Proceedings: Geological Society of Australia Special Publication 3, p. 429-442. -- Includes brief descriptions of several mafic/ultramafic layered sills in Archean greenstone belts near Kalgoorlie. -- J. A. B.

----- 1972, The nickel-sulphide-bearing ultramafic rocks and their environment in the Archaean of Western Australia: International Geological Congress, 24th, Montreal, 1972, Proceedings, sec. 1, p. 354-362.

McCall, G. J. H., and Leishman, J., 1971, Clues to the origin of Archaean eugeosynclinal peridotites and the nature of serpentization, in Glover, J. E., ed., Symposium on Archaean Rocks, Perth, 1972, Proceedings: Geological Society of Australia Special Publication 3, p. 281-299.

McGoldrick, P. J., and Keays, R. R., 1981, Precious and volatile metals in the Perseverance nickel deposit gossan; implications for exploration in weathered terrains: Economic Geology, v. 76, p. 1752-1763.

McLean, R. N., 1984, Embayments and volcanic controls on nickel mineralization at Widgie 3, Western Australia: Nedlands, University of Western Australia, B.Sc. Honours thesis, 108 p.

McQueen, K. G., 1979, Experimental heating and diffusion effects in Fe-Ni sulfide ore from Redross, Western Australia: Economic Geology, v. 74, p. 140-148.

----- 1979, Metamorphism and deformation of volcanic-associated nickel deposits: A study of mineralization around the Widgiemooltha dome, Western Australia: Nedlands, University of Western Australia, Ph.D. thesis, 417 p.

----- 1981, The nature and metamorphic history of the Wannaway nickel deposit, Western Australia: Economic Geology, v. 76, p. 1444-1468.

----- 1981, Volcanic-associated nickel deposits from around the Widgiemooltha dome, Western Australia: Economic Geology, v. 76, p. 1417-1443.

Middlemass, V., 1980, Nickel ore mining by Selcast Exploration Ltd. at Andrews Shaft, W.A., in Woodcock, J. T., ed., Mining and metallurgical practices in Australasia: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 10, p. 560-562.

Miller, L. J., 1975, The Archaean eugeosyncline of the Pilbara, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 55-63.

Miller, L. J., and Smith, M. E., 1975, Sherlock Bay nickel-copper, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 168-174.

Milton, D. W., 1972, An investigation of the siliceous "cap-rocks" in the vicinity of and over the Scotia nickel sulphide deposit, W. A.: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 33 p.

Moeskops, P. G., 1973, The Bulong serpentinite and environments of nickel mineralization near Kalgoorlie: London, U.K., University of London, Imperial College, Ph.D. thesis.

----- 1975, Cupriferous violarites from the Bulong complex near Kalgoorlie, Western Australia: Parkville, Victoria, Australian Mineral Development Laboratories Bulletin 20, p. 19-31.

----- 1977, Serpentine minerals from two areas of the Western Australian nickel belt: Mineralogical Magazine, v. 41, p. 313-322.

Moeskops, P. G., and Davis, G. R., 1977, Unusual sulphide replacement textures in altered olivine-rich rocks of the Bulong complex near Kalgoorlie, Western Australia: Mineralogical Magazine, v. 41, p. 473-479.

Moeskops, P. G., and Quick, D. H., 1971, Field and laboratory studies of the induced electrical polarization of serpentinized ultramafic rocks from the Western Australian Archaean nickel belt: London, Institution of Mining and Metallurgy Transactions, sec. B, v. 80, p. 85-94.

Naldrett, A. J., 1973, Nickel sulfide deposits--their classification and genesis, with special emphasis on deposits of volcanic association: Canadian Institute of Mining and Metallurgy Bulletin, v. 66, no. 739, p. 45-63 [see also Canadian Institute of Mining and Metallurgy Transactions, v. 76, p. 183-201].

----- 1981, Nickel sulfide deposits: Classification, composition, and genesis, in Skinner, B. J., ed., Economic Geology--seventy-fifth anniversary volume, 1905-1980: El Paso, Texas, Economic Geology Publishing Co., p. 628-685.

Naldrett, A. J., and Arndt, N. T., 1976, Volcanogenic nickel deposits with some guides for exploration: American Institute of Mining, Metallurgical and Petroleum Engineers Transactions, v. 260, p. 13-15.

Naldrett, A. J., and Cabri, L. J., 1976, Ultramafic and related mafic rocks: Their classification and genesis with special reference to the concentration of nickel sulfides and platinum-group elements: Economic Geology, v. 71, p. 1131-1158.

Naldrett, A. J., and Campbell, I. H., 1982, Physical and chemical constraints on genetic models for komatiite-related Ni-sulphide deposits, in Arndt, N. T., and Nisbet, E. G., eds., Komatiites: London, George Allen and Unwin, p. 423-434.

Naldrett, A. J., Duke, J. M., Lightfoot, P. C., and Thompson, J. F. H., 1984, Quantitative modelling of the segregation of magmatic sulphides; an exploration guide: Canadian Institute of Mining and Metallurgy Bulletin, v. 77, no. 864, p. 46-56.

Naldrett, A. J., Goodwin, A. M., Fisher, T. L., and Ridler, R. H., 1978, The sulfur content of Archean volcanic rocks and a comparison with ocean floor basalts: Canadian Journal of Earth Science, v. 15, p. 715-728.

Naldrett, A. J., Hoffman, E. L., Green, A. H., Chou, C.-L., Naldrett, S. R., and Alcock, R. A., 1979, The composition of Ni-sulfide ores with particular reference to their content of PGE and Au: Canadian Mineralogist, v. 17, p. 403-415.

- Naldrett, A. J., Hoffman, E. L., Green, A. H., and Naldrett, S. R., 1979, The composition of Ni-sulfide ores: Constraints on ore genesis: *Société Française de Minéralogie et de Cristallographie Bulletin*, v. 102, p. 455-462.
- Naldrett, A. J., and Turner, A. R., 1974, Contrasting volcanogenic nickel sulfide deposits in Western Australia: *Geological Society of America Abstracts with Programs*, v. 6, p. 885-886 [see also *Economic Geology*, v. 69, p. 1184].
- 1977, The geology and petrogenesis of a greenstone belt and related nickel sulfide mineralization at Yakabindie, Western Australia: *Precambrian Research*, v. 5, p. 43-103.
- Nesbitt, R. W., 1971, Skeletal crystal forms in the ultramafic rocks of the Yilgarn Block, Western Australia: Evidence for an Archaean ultramafic liquid, in Glover, J. E., ed., *Symposium on Archean Rocks*, Perth, 1970, *Proceedings: Geological Society of Australia Special Publication 3*, p. 331-347.
- 1971, The case for liquid immiscibility as a mechanism for nickel sulphide mineralisation in the Eastern Goldfields, Western Australia, in Glover, J. E., ed., *Symposium on Archean Rocks*, Perth, 1970, *Proceedings: Geological Society of Australia Special Publication 3*, p. 253.
- 1986, Are komatiitic lavas voracious?: *Nature*, v. 319, p. 97-98.
- Nesbitt, R. W., Purvis, A. C., Barry, J., and McKay, K. G., 1972, The Archaean greenstone peridotites of the Eastern Goldfields: An example of the peridotite-nickel sulphide association: *Geological Society of Australia Meeting, Canberra, 1972, Abstracts*, p. H3-H6.
- Nevill, M. W., 1974, The geology and mineralization of the Corkwood prospect area, Lamboo complex, East Kimberley, Western Australia: *Nedlands, University of Western Australia, B.Sc. Honours thesis*, 72 p.
- Nickel, E. H., 1985, Kambaldaite--a new secondary nickel mineral, in Morris, R. C., and others, eds., *Research review 1985: Canberra, New South Wales, CSIRO Division of Mineralogy and Geochemistry*, p. 33-34.
- Nickel, E. H., Allchurch, P. D., Mason, M. G., and Wilmshurst, J. R., 1977, Supergene alteration at the Perseverance nickel deposit, Agnew, Western Australia: *Economic Geology*, v. 72, p. 184-203.
- Nickel, E. H., Hallberg, J. A., and Halligan, R., 1979, Unusual nickel mineralization at Nullagine, Western Australia: *Geological Society of Australia Journal*, v. 26, p. 61-71.
- Nickel, E. H., and Hudson, D. R., 1976, The replacement of chrome spinel by chromian valleriite in sulphide-bearing ultramafic rocks in Western Australia: *Contributions to Mineralogy and Petrology*, v. 55, p. 265-277.
- Nickel, E. H., Hudson, D. R., Hill, R. E. T., Parks, T. C., Bussell, M., Wildman, J., and Robinson, B. W., 1983, Pyroaurite-related minerals from Western Australian nickel deposits, in Ewers, W. E., ed., *Research review 1983: Canberra, New South Wales, CSIRO Division of Mineralogy*, p. 68-71.
- Nisbet, E. G., and Chinner, G. A., 1981, Controls of the eruption of mafic and ultramafic lavas, Ruth Well Ni-Cu prospect, West Pilbara: *Economic Geology*, v. 76, p. 1729-1735.

O'Driscoll, E. S. T., 1971, Deformational concepts in relation to some ultramafic rocks in Western Australia, in Glover, J. E., ed., Symposium on Archean Rocks, Perth, 1970, Proceedings: Geological Society of Australia Special Publication 3, p. 351-366.

----- 1971, The tectonic pattern of the nickel province of southwestern Australia, in Takéuchi, Y., ed., International Association of the Genesis of Ore Deposits Meetings, Tokyo-Kyoto, 1971, Papers and Proceedings: Society of Mining Geologists of Japan Special Issue 3, p. 22-33.

----- 1981, A broad-scale structural characteristic of major nickel sulfide deposits of Western Australia: Economic Geology, v. 76, p. 1364-1372.

Oliver, R. L., and Ward, M., 1971, A petrological study of serpentinous rocks associated with nickel sulphide mineralisation at Pioneer, Western Australia, in Glover, J. E., ed., Symposium on Archean Rocks, Perth, 1970, Proceedings: Geological Society of Australia Special Publication 3, p. 311-319.

Omnes, G., 1974, Combined geophysical methods applied to exploration for nickel in Western Australia: Geoexploration, v. 12, p. 212-213.

Ostwald, J., and Lusk, J., 1978, Sulfide fabrics in some nickel sulfide ores from Kambalda, Western Australia: Canadian Journal of Earth Science, v. 15, p. 501-515.

Page, M. L., and Schmulian, M. L., 1981, The proximal volcanic environment of the Scotia nickel deposit: Economic Geology, v. 76, p. 1469-1479.

Palmer, A. J., 1980, Nickel ore mining by Western Mining Corporation Ltd. at Kambalda, W.A., in Woodcock, J. T., ed., Mining and metallurgical practices in Australasia: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 10, p. 562-566.

Parker, P., 1984, The role of contamination in the formation of the nickel sulphide ores at Wannaway and Mt. Edwards, Western Australia: Nedlands, University of Western Australia, B.Sc. Honours thesis, 144 p.

Paterson, H. L., Donaldson, M. J., Smith, R. N., Lenard, M. F., Gresham, J. J., Boyack, D. J., and Keays, R. R., 1984, Nickeliferous sediments and sediment-associated nickel ores at Kambalda, Western Australia, in Buchanan, D. L. and Jones, M. J., eds., Sulfide deposits in mafic and ultramafic rocks: London, Institution of Mining and Metallurgy, p. 81-94.

Porter, D. J., 1982, Geology and metamorphism of dunite-associated nickel-iron sulphide deposits of Forresteria, Western Australia: Nedlands, University of Western Australia, Ph.D. thesis, 312 p.

Porter, D. J., and McKay, K. G., 1981, The nickel sulfide mineralization and metamorphic setting of the Forresteria area, Western Australia: Economic Geology, v. 76, p. 1524-1549.

Prider, R. T., 1970, Nickel in Western Australia: Nature, v. 226, p. 691-693.

Pridmore, D. F., 1970, The Edwin nickel shoot, the results of V.L.F. electromagnetic induced polarization, magnetic, and gravity surveys: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 30 p.

Pridmore, D. F., Coggon, J. H., Esdale, D. J., and Lindeman, F. W., 1984, Geophysical exploration for nickel sulphide deposits in the Yilgarn Block, Western Australia, in Buchanan, D. L. and Jones, M. J., eds., Sulfide deposits in mafic and ultramafic rocks: London, Institution of Mining and Metallurgy, p. 22-34.

Purvis, A. C., 1978, The geochemistry and metamorphic petrology of the Southern Cross-Forrestania greenstone belt at Digger rocks, Western Australia: Adelaide, South Australia, University of Adelaide, Ph.D. thesis, 230 p.

Purvis, A. C., and Moeskops, P. G., 1981, Nickel-copper sulfide-rich Proterozoic dikes at Cowarna rocks, Western Australia: Economic Geology, v. 76, p. 1597-1605.

Purvis, A. C., Nesbitt, R. W., and Hallberg, J. A., 1972, The geology of part of the Carr Boyd Rocks complex and its associated nickel mineralization, Western Australia: Economic Geology, v. 67, p. 1093-1113.

Ramsden, A. R., 1975, Compositions of coexisting pyrrhotites, pentlandites and pyrites at Spargoville, Western Australia: Canadian Mineralogist, v. 13, p. 133-137.

Richardson, B. D., 1976, The geology of the Radio Hill layered intrusion: Nedlands, University of Western Australia, B.Sc. Honours thesis, 42 p.

Roberts, J. B., 1975, Windarra nickel deposits, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 129-143.

Robinson, W. B., Stock, E. C., and Wright, R., 1973, The discovery and evaluation of the Windarra nickel deposits, Western Australia, in Western Australia Conference, 1973, Papers: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Conference Series, no. 2, p. 69-90.

Ross, J. R., 1974, Archaean nickel sulfide mineralization, Lunnon shoot, Kambalda, Western Australia: Berkeley, University of California, Ph.D. thesis, 229 p.

Ross, J. R., and Hopkins, G. M. F., 1973, The nickel sulphide deposits of Kambalda, Western Australia, in Western Australia Conference, 1973, Papers: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Conference Series, no. 2, p. 119-120.

----- 1975, Kambalda nickel sulphide deposits, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 100-121.

Ross, J. R., and Keays, R. R., 1979, Precious metals in volcanic-type nickel sulfide deposits in Western Australia. I. Relationship with the composition of the ores and their host rocks: Canadian Mineralogist, v. 17, p. 417-435.

Ross, J. R., and Travis, G. A., 1981, The nickel sulfide deposits of Western Australia in global perspective: Economic Geology, v. 76, p. 1291-1329.

Sangster, D. F., 1978, Exhalites associated with Archaean volcanogenic massive sulphide deposits, in Glover, J. E., and Groves, D. I., eds., Archaean cherty metasediments: Their sedimentology, micropalaeontology, biogeochemistry and significance to mineralization: Nedlands, University of Western Australia, Geology Department and Extension Service Publication 2, p. 70-81.

Santul, J., 1975, The geology, geochemistry and mineralization of the South Windarra nickel ore deposit, W.A.: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 36 p.

Schmullian, M. L., 1984, Windarra nickel deposits, Western Australia, in Buchanan, D. L., and Jones, M. J., eds., Sulfide deposits in mafic and ultramafic rocks: London, Institution of Mining and Metallurgy, p. 95-102.

Schultz, K., 1975, Carr-Boyd Rocks nickel-copper deposits, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 125-128.

Seccombe, P. K., Groves, D. I., Binns, R. A., and Smith, J. W., 1978, A sulphur isotope study to test a genetic model for Fe-Ni sulphide mineralisation at Mt. Windarra, Western Australia, in Robinson, B. W., ed., Stable isotopes in the earth sciences: New Zealand Department of Scientific and Industrial Research Bulletin 220, p. 187-200.

Seccombe, P. K., Groves, D. I., Marston, R. J., and Barrett, F. M., 1981, Sulfide paragenesis and sulfur mobility in Fe-Ni-Cu sulfide ores at Lunnon and Juan Main shoots, Kambalda: Textural and sulfur isotopic evidence: Economic Geology, v. 76, p. 1675-1685.

Seigel, H. O., and Linford, G., 1975, The application of the MIP method to nickel exploration in Western Australia: Geophysics, v. 40, p. 155.

Shackleton, M. S., 1972, The geology of part of a greenstone belt at Bardoc, Western Australia: Nedlands, University of Western Australia, B.Sc. Honours thesis, 92 p.

Sheppy, N. R., and Rowe, J., 1975, Nepean nickel deposit, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 91-98.

Smith, B. H., Reddell, C. T., and Cleghorn, J. H., 1980, Mt. Windarra nickel deposit, Yilgarn Block, Western Australia: Journal of Geochemical Exploration, v. 12, p. 186-189.

Spies, B. R., 1980, The application of the transient electromagnetic method in Australian conditions--field examples and model studies: North Ryde, New South Wales, Macquarie University, Ph.D. thesis.

Stolz, G. W., 1971, The petrology, mineralogy and geochemistry of the nickel ore zone and host ultramafic rocks at Scotia, W. A.: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 32 p.

----- 1981, The Scotia nickel sulphide deposit: Adelaide, South Australia, University of Adelaide, Ph.D. thesis, 234 p.

Stolz, G. W., and Nesbitt, R. W., 1981, The komatiite nickel sulfide association at Scotia: A petrochemical investigation of the ore environment: *Economic Geology*, v. 76, p. 1480-1502.

Sun, S.-S., 1983, Implications of noble metal and Ni abundances in Archaean peridotitic komatiites to the genesis of associated nickel sulfide deposits, in Ewers, W. E., ed., *Research review 1983*: Canberra, New South Wales, CSIRO Division of Mineralogy, p. 52-53.

Talapatra, A. K., and Bose, S. S., 1978, A review of nickel-sulphide and associated base-metal mineralization in greenstone terrains of Western Australia and South India with emphasis on exploration: *Indian Minerals*, v. 32, no. 4, p. 10-20.

Tastula, R. A., 1980, Nickel ore mining by Western Mining Corporation Ltd. at Windarra, W.A., in Woodcock, J. T., ed., *Mining and metallurgical practices in Australasia*: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 10, p. 569-570.

Taylor, A. P., 1978, Textures in sulphide-bearing Archaean ultramafic rocks from the Spargoville area, Western Australia, [chap.] 33 of Verwoerd, W. J., ed., *Mineralization in metamorphic terranes*: Geological Society of South Africa Special Publication 4, p. 491-508.

Thomson, B. P., 1963, Nickel mineralization and the Giles Complex in the Tomkinson Ranges, South Australia: Geological Survey of South Australia Quarterly Geological Notes, no. 8, p. 2-3.

----- 1965, Weathering and related nickel mineralization, Mt. Davies area: Geological Survey of South Australia Quarterly Geological Notes, no. 16, p. 6-8.

Thornber, M. R., 1972, Pyrrhotite--the matrix of nickel sulphide mineralization, in Newcastle Conference, 1972, Papers: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Conference Series, no. 1, p. 51-58.

----- 1975, Supergene alteration of sulphides, I. A chemical model based on massive nickel sulphide deposits at Kambalda, Western Australia: *Chemical Geology*, v. 15, p. 1-14.

----- 1975, Supergene alteration of sulphides, II. A chemical study of the Kambalda nickel deposits: *Chemical Geology*, v. 15, p. 117-144.

Thornett, J. R., 1981, The Sally Malay deposit: Gabbroid-associated nickel-copper sulfide mineralization in the Halls Creek mobile zone, Western Australia: *Economic Geology*, v. 76, p. 1565-1580.

Tomich, B. N. V., 1974, The geology and nickel mineralization of the Ruth Well area, Western Australia: Nedlands, University of Western Australia, B.Sc. Honours thesis, 118 p.

Travis, G. A., 1975, Mount Clifford nickel deposit, in Knight, C. L., ed., *Economic geology of Australia and Papua New Guinea, I. Metals*: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 144-146.

Travis, G. A., 1975, Nickel-copper sulphide mineralization in the Jimberlana Intrusion, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 75-78.

Travis, G. A., Keays, R. R., and Davison, R. M., 1976, Palladium and iridium in the evaluation of nickel gossans in Western Australia: Economic Geology, v. 71, p. 1229-1243.

Turner, A. R., and Ranford, L. C., 1975, Six Mile nickel prospect, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 156-159.

Tyrer, M., 1974, The geology, structure and mineralization of the Trough Well prospect, Yilgarn goldfield, Western Australia: Nedlands, University of Western Australia, B.Sc. Honours thesis, 81 p.

Tyrwhitt, D. S., and Orridge, G. R., 1975, Regional geology and mineralization of the Fraser Range orogenic belt, Western Australia, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 405-408.

Usselman, T. M., Hodge, D. S., Naldrett, A. J., and Campbell, I. H., 1979, Physical constraints on the characteristics of nickel-sulfide ore in ultramafic lavas: Canadian Mineralogist, v. 17, p. 361-372.

Ward, M. A., 1967, A study of two diamond drill sections illustrating the geological setting and mineralization at Kambalda, W.A.: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 41 p.

Watchman, A. L., 1971, A study of two geological sections, and the petrology and geochemistry of the ultramafic rocks, Mount Windarra orebody, Western Australia: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 38 p.

Watmuff, I. G., 1970, Some local aspects of the geology, mineralography and geochemistry associated with the Edwin shoot, W. A.: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 24 p.

----- 1974, Supergene alteration of the Mt. Windarra nickel sulphide ore deposit, Western Australia: Mineralium Deposita, v. 9, p. 199-211.

Western Mining Corp. geological staff, 1978, Kambalda nickel deposits: Geological Survey of Western Australia Information Pamphlet 5, 15 p.

White, G. H., and Gee, C. E., 1977, Computerized geological and mining ore reserve systems at Western Mining's Kambalda nickel operations: International Symposium on the Application of Computers and Operations Research in the Mineral Industries, 15th, Brisbane, Australia, 1977, Papers, p. 263-274.

Wilding, I. G. P., 1980, Corkwood Cu-Ni prospect, Halls Creek Province, W.A.: Journal of Geochemical Exploration, v. 12, p. 220-224.

Willelt, G. C., 1975, Possible amygdaloidal sulfides in the Otter shoot, Kambalda, Western Australia: Economic Geology, v. 70, p. 1127 [with a reply by R. A. Keele, p. 1127-1129].

BIBLIOGRAPHY ON Ni-Cu-PGE DEPOSITS OF OCEANIA

ASSOCIATED WITH MAFIC ROCKS

Baker, G., 1959, Rodingite in nickeliferous serpentinite near Beaconsfield, northern Tasmania: Geological Society of Australia Journal, v. 6, p. 21-36.

Binns, R. A., 1983, Disseminated Ni-Cu-Co mineralization in Lower Palaeozoic ultramafic volcanics at Rockley, N.S.W., in Ewers, W. E., ed., Research review 1983: Canberra, New South Wales, CSIRO Division of Mineralogy, p. 48-49.

Blissett, A. H., 1962, One mile geological map series, Zeehan: Geological Survey of Tasmania Explanatory Report K 55-5-50, p. 246-251.

Brooks, J. H., 1979, Cobalt resources of Queensland: Queensland, Australia, Government Mining Journal, v. 80, no. 927, p. 17-25.

Brown, A. V., 1972, Petrology and structure of the Adamsfield ultramafic mass: Hobart, University of Tasmania, B.Sc. Honours thesis, 132 p.

Brown, A. V., Page, N. J., and Love, A. H., in press, Geology and platinum-group element (PGE) geochemistry of the Serpentine Hill Complex, Dundas Trough, Western Tasmania: Canadian Mineralogist, v. 26.

Cabri, L. J., and Harris, D. C., 1975, Zoning in Os-Ir alloys and the relationship of the geological and tectonic environment of the source rocks to the bulk Pt:Pt+Ir+Os ratio for placers: Canadian Mineralogist, v. 13, p. 266-274.

Challis, G. A., 1965, The origin of New Zealand ultramafic intrusions: Journal of Petrology, v. 6, p. 322-364.

Elliston, J., 1965, Platinoid deposits of Tasmania, in McAndrew, J., ed., Geology of Australian ore deposits (2nd ed.): Commonwealth Mining and Metallurgical Congress, 8th, Melbourne, 1965, Publications, v. 1, p. 522.

Ford, R. J., 1981, Platinum-group minerals in Tasmania: Economic Geology, v. 76, p. 498-504.

Green, T. H., 1966, Geology of the Trial Harbour district: The Royal Society of Tasmania Papers and Proceedings, v. 100, p. 1-20.

Groves, D. I., 1966, The geology of the Heazlewood-Godkin area: Tasmania Mines Department Technical Report 10 (1965), p. 27-40.

Henley, K. J., Cooper, R. S., Lowder, G. G., Radke, F., and Watmuff, I. G., 1973, The quantitative mineralogical evaluation of nickel ores and their processing products, in Western Australia Conference, 1973, Papers: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Conference Series, no. 2, p. 401-415.

Hillier, G., 1976, Growth of the Australian nickel industry: Australian Mineral Industry Quarterly Review, v. 28, no. 4, p. 99-113.

Hillier, G., 1977, Platinum group metals (iridium, osmium, palladium, platinum, rhodium, ruthenium): Australian Mineral Industry Annual Review 1975, p. 274-276.

----- 1980, Cobalt: Australian Mineral Industry Annual Review 1978, p. 88-90.

----- 1980, Nickel: Australian Mineral Industry Annual Review 1978, p. 163-170.

----- 1980, Platinum-group metals (iridium, osmium, palladium, platinum, rhodium, ruthenium): Australian Mineral Industry Annual Review 1978, p. 193-195.

Hughes, T. D., 1958, McCormick-Miller nickel prospect: Tasmania Mines Department Technical Report 2 (1957), p. 106-109.

----- 1965, Nickel mineralization in Tasmania, in McAndrew, J., ed., Geology of Australian ore deposits (2nd ed.): Commonwealth Mining and Metallurgical Congress, 8th, Melbourne, 1965, Publications, v. 1, p. 523-524.

Ingram, J. A., compiler, 1973, Nickel deposits (2nd ed.): Australian Bureau of Mineral Resources, Geology, and Geophysics Report 2, 31 p.

Johnston, M. R., 1974, Geology of the Mount Arthur district, north-west Nelson: New Zealand Journal of Geology and Geophysics, v. 17, p. 75-92.

Keays, R. R., and Kirkland, M. C., 1976, Hydrothermal mobilization of gold from copper-nickel sulfides and ore genesis at the Thomson River copper mine, Victoria, Australia: Economic Geology, v. 67, p. 1263-1275.

Lowenstein, P. L., and Pieters, P. E., 1974, Gold and platinum in the East and West Sepik districts: Papua New Guinea Geological Survey Report 74/25, 14 p.

Miller, P. G., and Gerdes, R. A., 1972, Investigation of Kenmore Park nickel prospect No. 1, Northwest Province: South Australia Mineral Resources Review 132, p. 155-173.

Nye, P. B., 1929, The osmiridium deposits of the Adamsfield district: Geological Survey of Tasmania Bulletin 39, 74 p.

Pain, A. M., 1975, Marryat nickel prospects; drilling completion report: South Australia Mineral Resources Review 138, p. 70-78.

Pratt, R., 1981, Cobalt: Australian Mineral Industry Annual Review 1979, p. 95-96.

----- 1981, Nickel: Australian Mineral Industry Annual Review 1979, p. 183-191.

----- 1981, Platinum-group metals (iridium, osmium, palladium, platinum, rhodium, ruthenium): Australian Mineral Industry Annual Review 1979, p. 213-215.

Ranford, L. C., 1977, Cobalt: Australian Mineral Industry Annual Review 1975, p. 123-126.

----- 1977, Nickel: Australian Mineral Industry Annual Review 1975, p. 227-241.

- Reid, A. M., 1921, Osmiridium in Tasmania: Geological Survey of Tasmania Bulletin 32, 126 p.
- Robinson, R. G., 1959, Recent drilling of the Cuni deposits: Tasmania Mines Department Technical Report 3 (1958), p. 11-27.
- Spratt, R. N., 1975, Adau River sulphide nickel prospect, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 877-878.
- Stewart, Neil, ed., 1974, Australian mining: Australian Mining, v. 66, no. 2, 110 p.
- Taylor, B. L., and Burger, D., 1952, Five Mile copper nickel deposits: Tasmania Department of Mines report, p. 72-97.
- Thieme, Pamela, 1970, Nickel deposits: Australian Bureau of Mineral Resources, Geology, and Geophysics Report 2, 18 p.
- Twelvetrees, W. H., 1914, The Bald Hill osmiridium field: Geological Survey of Tasmania Bulletin 17, 44 p.
- Warne, K. R., 1967, Kenmore Park nickel prospect, Northwest Province: South Australia Mineral Resources Review 127, p. 61-67.
- Williams, G. J., 1974, Metallic minerals, in Williams, G. J., ed., Economic geology of New Zealand: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 4, p. 383-437.
- 1974, Minerals associated with ultramafic rocks, in Williams, G. J., ed., Economic geology of New Zealand: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 4, p. 143-166.
- Williams, K. L., 1958, Nickel mineralization in Western Tasmania, in Stillwell anniversary volume: Parkville, Victoria, Australasian Institute of Mining and Metallurgy, p. 263-302.
- Woodall, Roy, 1974, Nickel resources of Australia, in Circum-Pacific Energy and Mineral Resources Conference, Honolulu, 1974: American Association of Petroleum Geologists Bulletin, v. 58, p. 1462.
- 1974, Nickel resources of Australia--summary, in Halbouty, M. T., Maher, J. C., and Lian, H. M., eds., Circum-Pacific energy and mineral resources: American Association of Petroleum Geologists Memoir 25, p. 399-409.

BIBLIOGRAPHY ON GOSSANS, SUPERGENE MINERALIZATION, AND WEATHERING OF
AUSTRALIAN Ni SULFIDE DEPOSITS

Arndt, C. D., 1980, Carnilya Hill Ni-mineralization, Yilgarn Block, W.A., in Butt, C. R. M., and Smith, R. E., eds., Conceptual models in exploration geochemistry: Journal of Geochemical Exploration, v. 12, p. 171-173.

Blain, C. F., and Andrew, R. L., 1977, Sulphide weathering and the evaluation of gossans in mineral exploration: Mineral Science and Engineering, v. 9, p. 119-150.

Blain, C. F., and Brotherton, R. L., 1975, Self-potentials in relation to oxidation of nickel sulphide bodies within semi-arid climatic terrains: London, Institution of Mining and Metallurgy Transactions, sec. B, v. 84, p. 123-127.

Bull, A. J., and Mazzucchelli, R. H., 1975, Application of discriminant analysis to the geochemical evaluation of gossans, in Elliott, I. L., and Fletcher, W. K., eds., Geochemical exploration 1974: Amsterdam, Elsevier, v. 1, p. 219-226.

Burrill, G. H. R., and Howland-Rose, A. W., 1970, Mineral exploration in Western Australia: Canadian Mining Journal, April 1970, p. 106-110.

Butt, C. R. M., 1981, Some aspects of geochemical exploration in lateritic terrain in Australia, in Lateritization processes; International Seminar on Lateritization Processes, Trivandrum, India, 1979, Proceedings: Rotterdam, A. A. Balkema, p. 369-380.

----- 1981, The nature and origin of the lateritic weathering mantle, with particular reference to Western Australia, in Doyle, H. A., Glover, J. E., and Groves, D. I., eds., Geophysical prospecting in deeply weathered terrains: Nedlands, University of Western Australia, Geology Department and Extension Service Publication 6, p. 11-29.

----- 1983, Lithological and regional variations of deep weathering profiles, in Ewers, W. E., ed., Research review 1983: Canberra, New South Wales, CSIRO Division of Mineralogy, p. 149-151.

Butt, C. R. M., and Nickel, E. H., 1981, Mineralogy and geochemistry of the weathering of the disseminated nickel sulfide deposit at Mt. Keith, Western Australia: Economic Geology, v. 76, p. 1736-1751.

Butt, C. R. M., and Sheppy, N. R., 1974, Geochemical exploration problems in Western Australia, exemplified by the Mt. Keith area: International Geochemical Exploration Symposium, 5th, London, 1974, Proceedings, p. 19-20.

----- 1975, Geochemical exploration problems in Western Australia exemplified by the Mt. Keith area, in Elliott, I. L., and Fletcher, W. K., eds., Geochemical exploration 1974: Amsterdam, Elsevier, v. 1, p. 391-415.

Butt, C. R. M., and Smith, R. E., 1980, eds., Conceptual models in exploration geochemistry: Journal of Geochemical Exploration, v. 12, nos. 2/3 (special issue), p. 89-365.

Christensen, S., and Friedrich, G., 1975, Sekundaere geochemische Dispersion im Bereich sulfidischer Mineral-Vorkommen in ariden Gebieten Westaustraliens [Secondary geochemical dispersion in the vicinity of sulfide mineral deposits in arid regions of Western Australia]: Gesellschaft Deutscher Metallhuetten- und Bergleute, Schriften 28, Geochemie der Lagerstaettenbildung und -prospektion, p. 303-320.

Clema, J. M., and Stevens-Hoare, N. P., 1973, A method of distinguishing nickel gossans from other ironstones on the Yilgarn Shield, Western Australia: Journal of Geochemical Engineering, v. 2, p. 393-402.

Cochrane, R. H. A., 1973, A guide to the geochemistry of nickeliferous gossans and related rocks from the Eastern Goldfields: Geological Survey of Western Australia Annual Report 1972, p. 69-75.

Coggon, J. H., 1974, Geophysical environment of nickel deposits near Kambalda, Western Australia: Geoexploration, v. 12, p. 225.

Cole, M., 1973, Geobotanical and biogeochemical investigations in the sclerophyllous woodland and shrub associations of the Eastern Goldfields area of Western Australia, with particular reference to the role of Hybanthus Floribundus (Lindl) F. Muell as a nickel indicator and accumulator plant: Journal of Applied Ecology, v. 10, p. 269-320.

Cox, R., 1974, Geochemical soil surveys in exploration for nickel-copper sulphides at Pioneer, near Norseman, Western Australia: International Geochemical Exploration Symposium, 5th, London, 1974, Proceedings, p. 25-26.

----- 1975, Geochemical soil surveys in exploration for nickel-copper sulphides at Pioneer, near Norseman, Western Australia, in Elliott, I. L., and Fletcher, W. K., eds., Geochemical exploration 1974: Amsterdam, Elsevier, v. 1, p. 437-460.

Daniels, J. L., 1974, The geology of the Blackstone region, Western Australia: Geological Survey of Western Australia Bulletin 123, 257 p.

Davy, R. L., 1978, A comparative study of the geochemistry of Archaean bedrock in part of the northeast Yilgarn Block: Geological Survey of Western Australia Report 4, 90 p.

Doyle, H. A., 1981, Comments on geophysical exploration in Australia, in Doyle, H. A., Glover, J. E., and Groves, D. I., eds., Geophysical prospecting in deeply weathered terrains: Nedlands, University of Western Australia, Geology Department and Extension Service Publication 6, p. 1-10.

Drew, G. J., 1971, A geochemical study of the weathering zone at Mt. Windarra, Western Australia: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 93 p.

Elias, M., Donaldson, M. J., and Giorgetta, N. E., 1981, Geology, mineralogy, and chemistry of lateritic nickel-cobalt deposits near Kalgoorlie, Western Australia: Economic Geology, v. 76, p. 1775-1783.

Friedrich, G. H. W., and Christensen, S. M., 1977, Geochemical dispersion patterns associated with the Lake Yindarlgooda sulphide mineralization, Western Australia: Journal of Geochemical Exploration, v. 8, p. 219-234.

Glover, J. E., Groves, D. I., and Smith, R. E., 1979, Pathfinder and multi-element geochemistry in mineral exploration: Nedlands, University of Western Australia, Geology Department and Extension Service Publication 4, 116 p.

Hall, J. S., Both, R. A., and Smith, F. A., 1973, A comparative study of rock, soil and plant chemistry in relation to nickel mineralization in the Pioneer area, Western Australia: Australasian Institute of Mining and Metallurgy Proceedings, no. 247, p. 11-22.

Hiern, M. N., 1975, Nickeliferous ochre on Giles Complex rocks in South Australia, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 1009.

Joyce, A. S., and Clema, J. M., 1974, An application of statistics to the chemical recognition of nickel gossans in the Yilgarn Block, Western Australia: Australasian Institute of Mining and Metallurgy Proceedings, no. 252, p. 21-24.

Keele, R. A., and Nickel, E. H., 1974, The geology of a primary millerite-bearing sulfide assemblage and supergene alteration at the Otter shoot, Kambalda, Western Australia: Economic Geology, v. 69, p. 1102-1117 [also see discussion and reply, Economic Geology, v. 70, p. 1127-1129].

Lawrence, M. J., 1974, Supergene nickel deposits: Origins and features, in Southern & Central Queensland Conference, 1974, Papers: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Conference Series, no. 3, p. 523-542.

Leggo, M. D., and McKay, K. G., 1980, Forrestania Ni deposits, Yilgarn Block, W.A., in Butt, C. R. M., and Smith, R. E., eds., Conceptual models in exploration geochemistry: Journal of Geochemical Exploration, v. 12, p. 178-183.

Loftus-Hills, G. D., 1973, Lateritic nickel deposits at Ora Banda, Western Australia, in Western Australia Conference, 1973, Papers: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Conference Series, no. 2, p. 171.

----- 1975, Ora Banda lateritic nickel deposits, W.A., in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 1010.

Mazzucchelli, R. H., 1972, Secondary geochemical dispersion patterns associated with the nickel sulphide deposits at Kambalda, Western Australia: Journal of Geochemical Exploration, v. 1, p. 103-116.

McGoldrick, P. J., and Keays, R. R., 1981, Precious and volatile metals in the Perseverance nickel deposit gossan; implications for exploration in weathered terrains: Economic Geology, v. 76, p. 1752-1763.

Moeskops, P. G., 1976, Yilgarn nickel gossan geochemistry; a review including new data and considerations: International Geological Congress, 25th, Sydney, 1976, Abstracts, v. 2, p. 449-450.

Moeskops, P. G., 1977, Yilgarn nickel gossan geochemistry--a review, with new data: *Journal of Geochemical Exploration*, v. 8, p. 247-258.

Moeskops, P. G., and Quick, D. H., 1971, Field and laboratory studies of the induced electrical polarization of serpentized ultramafic rocks from the Western Australian Archaean nickel belt: London, Institution of Mining and Metallurgy Transactions, sec. B, v. 80, p. 85-94.

Nickel, E. H., 1973, Violarite, a key mineral in the supergene alteration of nickel sulphide ores, *in* Western Australia Conference, 1973, Papers: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Conference Series, no. 2, p. 111-116.

----- 1985, Kambaldaite--a new secondary nickel mineral, *in* Morris, R. C., and others, eds., Research review 1985: Canberra, New South Wales, CSIRO Division of Mineralogy and Geochemistry, p. 33-34.

Nickel, E. H., Allchurch, P. D., Mason, M. G., and Wilmshurst, J. R., 1977, Supergene alteration at the Perseverance nickel deposit, Agnew, Western Australia: *Economic Geology*, v. 72, p. 184-203.

Nickel, E. H., and Bridge, P. J., 1975, A garnierite with a high nickel content from Western Australia: *Mineralogical Magazine*, v. 40, p. 65-69.

Nickel, E. H., and Daniels, J. L., 1985, Gossans, chap. 4 *of* Wolfe, K. H., ed., Handbook of strata-bound and stratiform ore deposits: Amsterdam, Elsevier, v. 13, p. 261-390.

Nickel, E. H., Davis, C. E. S., Bussell, M., Bridge, P. J., Dunn, J. G., and MacDonald, R. D., 1977, Eardleyite as a product of the supergene alteration of nickel sulfides in Western Australia: *American Mineralogist*, v. 62, p. 449-457.

Nickel, E. H., and Hudson, D. R., 1976, The replacement of chrome spinel by chromian valleriite in sulphide-bearing ultramafic rocks in Western Australia: *Contributions to Mineralogy and Petrology*, v. 55, p. 265-277.

Nickel, E. H., Ross, J. R., and Thornber, M. R., 1974, The supergene alteration of pyrrhotite-pentlandite ore at Kambalda, Western Australia: *Economic Geology*, v. 69, p. 93-107.

Nickel, E. H., and Thornber, M. R., 1976, Chemical constraints on the weathering of serpentinites containing Ni-Fe sulfides: *International Geological Congress, 25th, Sydney, 1976, Abstracts*, v. 2, p. 451.

----- 1977, Chemical constraints on the weathering of serpentinites containing nickel-iron sulphides: *Journal of Geochemical Exploration*, v. 8, p. 235-245.

Noldart, A. J., 1975, Beaconsfield lateritic nickel deposits, Tasmania, *in* Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 1006-1007.

Pryce, M. W., and Just, J., 1974, Glaukosphaerite: A new nickel analogue of rosasite: *Mineralogical Magazine*, v. 39, p. 737-743.

Roberts, D. E., and Travis, G. A., 1973, Textural evaluation of nickel sulphide gossans, in Western Australia Conference, 1973, Papers: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Conference Series, no. 2, p. 97.

Smith, B. H., 1976, Some aspects of the use of geochemistry in the search for base-metal sulphides in lateritic terrain in Western Australia: International Geological Congress, 25th, Sydney, 1976, Abstracts, v. 2, p. 458-459.

----- 1977, Some aspects of the use of geochemistry in the search for nickel sulphides in lateritic terrain in Western Australia: Journal of Geochemical Exploration, v. 8, p. 259-281.

----- 1984, Geochemical exploration for nickel sulphides in lateritic terrain in Western Australia, in Buchanan, D. L., and Jones, M. J., eds., Sulfide deposits in mafic and ultramafic rocks: London, Institution of Mining and Metallurgy, p. 35-42.

Smith, B. H., Reddell, C. T., and Cleghorn, J. H., 1980, Mt. Windarra Ni deposit, Yilgarn Block, W.A.: Journal of Geochemical Exploration, v. 12, p. 186-189.

Smith, R. E., ed., 1982, Geochemical exploration in deeply weathered terrain: Floreat Park, Western Australia, CSIRO Institute of Energy and Earth Resources, Division of Mineralogy, 190 p.

Smith, R. E., Butt, C. R. M., and Bettenay, E., eds., 1976, Superficial mineral deposits and exploration geochemistry, Yilgarn Block, Western Australia (including nickel deposits at Kambalda, Ora Banda, Redross and the Widgiemooltha dome, Perseverance, and Mt. Keith): International Geological Congress, 25th, Sydney, 1976, Excursion Guide 41C, 50 p.

Sprigg, R. C., and Rochow, K., 1975, Nickeliferous ochres in the Hinckley (W.A.) and Tomkinson (S.A.) Ranges ("Daisy Bates" - Wingelinna Field), in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 1008.

Stewart, A. J., and Warren, R. G., 1977, The mineral potential of the Arunta Block, central Australia: BMR Journal of Australian Geology and Geophysics, v. 2, p. 21-34.

Taylor, G. F., and Sylvester, G. C., 1983, Mineralogy and geochemistry of selected gossan profiles, in Ewers, W. E., ed., Research review 1983: Canberra, New South Wales, CSIRO Division of Mineralogy, p. 160-162.

Thomson, B. P., 1965, Weathering and related nickel mineralization, Mt. Davies area: Geological Survey of South Australia Quarterly Geological Notes, no. 16, p. 6-8.

Thornber, M. R., 1975, Supergene alteration of sulphides, I. A chemical model based on massive nickel sulphide deposits at Kambalda, Western Australia: Chemical Geology, v. 15, p. 1-14.

----- 1975, Supergene alteration of sulphides, II. A chemical study of the Kambalda nickel deposits: Chemical Geology, v. 15, p. 117-144.

Thornber, M. R., 1979, Supergene alteration of sulfides, V. Laboratory studies of the dispersion of Ni, Cu, Co and Fe: *Chemical Geology*, v. 26, p. 135-149.

----- 1983, Electrochemical measurements of the stabilities of pentlandite and violarite, in Ewers, W. E., ed., *Research review 1983*: Canberra, New South Wales, CSIRO Division of Mineralogy, p. 71-73.

----- 1983, Thermodynamic stabilities of nickel-sulfides from mineralogical study of their weathering, in Ewers, W. E., ed., *Research review 1983*: Canberra, New South Wales, CSIRO Division of Mineralogy, p. 73-75.

----- 1983, The chemical processes of sulfide weathering to form gossanous material, in Ewers, W. E., ed., *Research review 1983*: Canberra, New South Wales, CSIRO Division of Mineralogy, p. 171-174.

----- 1983, Natural polarization of sulfide ores as it affects induced polarization, in Ewers, W. E., ed., *Research review 1983*: Canberra, New South Wales, CSIRO Division of Mineralogy, p. 212.

----- 1983, Mineralogical and electrochemical stability of the nickel-iron sulphides--pentlandite and violarite: *Journal of Applied Electrochemistry*, v. 13, p. 253-267.

----- 1985, Supergene alteration of sulphides, VII. Distribution of elements during the gossan-forming process: *Chemical Geology*, v. 53, p. 279-301.

Thornber, M. R., Allchurch, P. D., and Nickel, E. H., 1981, Variations in gossan geochemistry at the Perseverance nickel sulfide deposit, Western Australia: A descriptive and experimental study: *Economic Geology*, v. 76, p. 1764-1774.

Thornber, M. R., and Nickel, E. H., 1976, Supergene alteration of sulphides, III. The composition of associated carbonates: *Chemical Geology*, v. 17, p. 45-72.

----- 1983, The influence of wallrock on the geochemistry of base-metal gossans, in Ewers, W. E., ed., *Research review 1983*: Canberra, New South Wales, CSIRO Division of Mineralogy, p. 174-178.

Thornber, M. R., and Wildman, J. E., 1979, Supergene alteration of sulphides, IV. Laboratory study of the weathering of nickel ores: *Chemical Geology*, v. 24, p. 97-110.

----- 1983, The stability of pyroaurite-type compounds in the Fe-Ni, Fe-Zn and Fe-Co systems, in Ewers, W. E., ed., *Research review 1983*: Canberra, New South Wales, CSIRO Division of Mineralogy, p. 187-189.

----- 1984, Supergene alteration of sulphides, VI. The binding of Cu, Ni, Zn, Co and Pb with gossan (iron-bearing) minerals: *Chemical Geology*, v. 44, p. 399-434.

Travis, G. A., Keays, R. R., and Davison, R. M., 1976, Palladium and iridium in the evaluation of nickel gossans in Western Australia: *Economic Geology*, v. 71, p. 1229-1243.

Watmuff, L. G., 1974, Supergene alteration of the Mt. Windarra nickel sulphide ore deposit, Western Australia: *Mineralium Deposita*, v. 9, p. 199-221.

Wilmschurst, J. R., 1974, The weathering products of nickeliferous sulphides and their associated rocks in Western Australia: International Geochemical Exploration Symposium, 5th, London, 1974, Proceedings, p. 58-59.

Wilmschurst, J. R., 1975, The weathering products of nickeliferous sulphides and their associated rocks in Western Australia, in Elliott, I. L., and Fletcher, W. K., eds., Geochemical exploration 1974: Amsterdam, Elsevier, v. 1, p. 417-436.

----- 1976, The recognition of gossans and related rocks: International Geological Congress, 25th, Sydney, 1976, Abstracts, v. 2, p. 464-465.

BIBLIOGRAPHY ON LAYERED MAFIC INTRUSIONS IN AUSTRALASIA

Ahmat, A. L., 1983, Structure, stratigraphy and mineralization potential of the anorthositic Windimurra gabbroid, Yilgarn Block, Western Australia: Geological Society of Australia Abstract Series, no. 9, p. 265-266. -- Summarizes mineralogy, stratigraphy, form, structure, and significance. Compares with Bushveld, Stillwater, and particularly Fiskenaeset. Preliminary Sm-Nd age of 3050 Ma. -- J. A. B.

----- 1986, Petrology, structure, regional geology and age of the gabbroic Windimurra Complex, Western Australia: Nedlands, University of Western Australia, Ph.D. thesis, 279 p.

Ahmat, A. L., and de Laeter, J. R., 1982, Rb-Sr isotopic evidence for Archaean-Proterozoic crustal evolution of part of the central Yilgarn Block, Western Australia: Constraints on the age and source of the anorthositic Windimurra gabbroid: Geological Society of Australia Journal, v. 29, p. 177-190. -- Rb-Sr age of 2669 ± 135 Ma for porphyry dike gives minimum age for emplacement of Windimurra gabbroid. Isotopic evidence indicates upper-mantle source for gabbroid. -- J. A. B.

Ambler, E. P., and Ashley, P. M., 1977, Vermicular orthopyroxene-magnetite symplectites from the Wateranga layered mafic intrusion, Queensland, Australia: Lithos, v. 10, p. 163-172.

Arnold, G. O., and Rubenach, M. J., 1976, Mafic-ultramafic complexes of the Greenvale area, north Queensland: Devonian intrusions or Precambrian metamorphics?: Geological Society of Australia Journal, v. 23, p. 119-139.

Baxter, D. R., 1971, The petrology and geochemistry of an ultramafic body near Ravensthorpe Phillips River Goldfield, Western Australia: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 28 p.

Briese, E. H., 1970, The geology, petrology and geochemistry of a layered intrusion at Carr Boyd Rocks, W.A.: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 23 p.

Brown, A. V., 1986, Geology of the Dundas-Mt. Lindsay-Mt. Youngbuck region: Geological Survey of Tasmania Bulletin 62, 221 p.

Brown, A. V., Page, N. J., and Love, A. H., 1985, Platinum-group-element geochemistry of the Serpentine Hill Complex, Dundas Trough, western Tasmania: Canadian Mineralogist, v. 23, p. 297.

Brown, A. V., Rubenach, M. J., and Varne, R., 1980, Geological environment, petrology, and tectonic significance of the Tasmanian Cambrian ophiolitic and ultramafic complexes, in Panayiotou, A., ed., Ophiolites: International Ophiolite Symposium, Cyprus, 1979, Proceedings: Nicosia, Geological Survey Department, p. 649-659.

Bunting, J. A., de Laeter, J. R., and Libby, W. G., 1976, Tectonic subdivisions and geochronology of the northeastern part of the Albany-Fraser Province, Western Australia: Geological Survey of Western Australia Annual Report 1975, p. 117-126.

Bunting, J. A., and Williams, S. J., 1979, Sir Samuel, W. A.: Geological Survey of Western Australia, 1:250,000 Geological Series--Explanatory Notes, 40 p. -- Brief description of layered mafic intrusion within the Archaean greenstone belt at Kathleen Valley. -- J. A. B.

Campbell, I. H., 1966, The petrology of the Jimberlana norite near Norseman, Western Australia: Nedlands, University of Western Australia, B.Sc. Honours thesis, 240 p.

----- 1968, The origin of the heteradcumulate and adcumulate textures in the Jimberlana norite: Geological Magazine, v. 105, p. 378-383.

----- 1973, Aspects of the petrology of the Jimberlana Layered Intrusion of Western Australia: London, U.K., University of London, Imperial College, Ph.D. thesis, 216 p.

----- 1977, A study of macro-rhythmic layering and cumulate processes in the Jimberlana Intrusion, Western Australia. Part I: The upper layered series: Journal of Petrology, v. 18, p. 183-215.

----- 1978, Some problems with the cumulus theory: Lithos, v. 11, p. 311-323.

----- 1986, Distribution of orthocumulate textures in the Jimberlana Intrusion: Journal of Geology, v. 95, p. 35-54.

----- 1986, The distribution of orthocumulate textures in the Jimberlana Intrusion: Implications for the efficiency of fractional crystallization: Geological Association of Canada-Mineralogical Association of Canada Joint Annual Meeting, Program with Abstracts, v. 11, p. 51.

Campbell, I. H., and Borley, G. D., 1974, The geochemistry of pyroxenes from the lower layered series of the Jimberlana Intrusion, Western Australia: Contributions to Mineralogy and Petrology, v. 47, p. 281-97.

Campbell, I. H., McCall, G. J. H., and Tyrwhitt, D. S., 1970, The Jimberlana norite, Western Australia--a smaller analogue of the Great Dyke of Rhodesia: Geological Magazine, v. 107, p. 1-12.

Cassidy, K. F., 1985, Compositions of magmatic ilmenites: Petrogenetic indicators of parent-magma composition: Nedlands, University of Western Australia, B.Sc. Honours thesis, 89 p.

Daniels, J. L., 1967, Subdivision of the Giles Complex, central Australia: Geological Survey of Western Australia Annual Report 1966, p. 58-62.

----- 1974, The Giles Complex, in The geology of the Blackstone region, Western Australia: Geological Survey of Western Australia Bulletin 123, p. 100-193.

----- 1975, Musgrove Block, in The geology of Western Australia: Geological Survey of Western Australia Memoir 2, p. 194-205.

Davy, R. L., 1978, A comparative study of the geochemistry of Archaean bedrock in part of the northeast Yilgarn Block: Geological Survey of Western Australia Report 4, 90 p. -- Includes whole-rock geochemistry of suite from the Mt. Venn layered intrusion (Archaean). -- J. A. B.

Donaldson, J. J., 1974, Petrology of the Munni Munni complex, Roebourne, Western Australia: Geological Society of Australia Journal, v. 21, p. 1-16.

Dow, D. B., and Gemuts, I., 1969, Geology of the Kimberley region, Western Australia: The East Kimberley: Geological Survey of Western Australia Bulletin 120, 135 p. [also issued as Australian Bureau of Mineral Resources, Geology, and Geochemistry Bulletin 106, 135 p.]

Facer, R. A., 1967, A preliminary study of the magnetic properties of rocks from the Giles Complex, central Australia: Australian Journal of Science, v 30, p. 237-238.

----- 1969, Magnetic properties of the Giles Complex, central Australia: Sydney, New South Wales, University of Sydney, Ph.D. thesis, 105 p.

----- 1970, Magnetic properties of the Giles Complex, central Australia: Search, v. 1, p. 76-77.

----- 1971, Iron-titanium oxide minerals from the Giles Complex, central Australia: Australasian Institute of Mining and Metallurgy Proceedings, v. 239, p. 51-58.

Flood, R. H., and Shaw, S. E., 1979, K-rich cumulate diorite at the base of a tilted granodiorite pluton from the New England Batholith, Australia: Journal of Geology, v. 87, p. 417-425.

Franklin, B. J., 1976, The geology of the North Mooney complex: Sydney, University of New South Wales, Ph.D. thesis, 296 p.

Gee, R. D., and Legge, P. J., 1974, Geological atlas 1 mile series. Zone 7, Beaconsfield: Geological Survey of Tasmania Exploration Report Sheet 30 (8215N), 116 p.

Gemuts, I., 1971, Metamorphic and igneous rocks of the Lamboo complex, East Kimberley region, Western Australia: Australia Bureau of Mineral Resources, Geology, and Geophysics Bulletin 107, 71 p. -- Includes descriptions and regional setting of Cr and PGE-bearing layered sills in the East Kimberley region (e.g., Panton sill). -- J. A. B.

Glikson, A. Y., and Hickman, A. H., 1981, Geochemical stratigraphy and petrogenesis of Archaean basic-ultrabasic volcanic units, Eastern Pilbara Block, Western Australia, in Glover, J. E., and Groves, D. I., eds., Archaean geology: Geological Society of Australia Special Publication 7, p. 287-300.

Goode, A. D. T., 1970, The petrology and structure of the Kalka and Ewarara layered basic intrusions, Giles Complex, central Australia: Adelaide, South Australia, University of Adelaide, Ph.D. thesis, 438 p.

----- 1976, Sedimentary structures and magma current velocities in the Kalka layered intrusion, central Australia: Journal of Petrology, v. 17, p. 546-558.

----- 1976, Small scale primary cumulus igneous layering in the Kalka layered intrusion, Giles Complex, central Australia: Journal of Petrology, v. 17, p. 379-397.

----- 1977, Flotation and remelting of plagioclase in the Kalka intrusion, central Australia: Petrological implications for anorthosite genesis: Earth and Planetary Science Letters, v. 34, p. 375-380.

Goode, A. D. T., 1977, Intercumulus igneous layering in the Kalka layered intrusion, central Australia: Geological Magazine, v. 114, p. 215-218.

----- 1977, Vertical igneous layering in the Ewarara layered intrusion, central Australia: Geological Magazine, v. 114, p. 365-374.

----- 1978, High temperature, high strain rate deformation in the lower crustal Kalka intrusion, central Australia: Contributions to Mineralogy and Petrology, v. 66, p. 137-148.

Goode, A. D. T., and Krieg, G. W., 1965, The geology of the Ewarara intrusion, Giles Complex, central Australia: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 94 p.

----- 1967, The geology of the Ewarara intrusion, Giles Complex, central Australia: Geological Society of Australia Journal, v. 14, p. 185-194.

Goode, A. D. T., and Moore, A. C., 1975, High pressure crystallisation of the Ewarara, Kalka, and Gosse Pile intrusions, Giles Complex: Contributions to Mineralogy and Petrology, v. 51, p. 77-97.

Goode, A. D. T., and Nesbitt, R. W., 1969, Granulites and basic intrusions of part of the eastern Tomkinson Ranges, central Australia, in Brown, D. A., ed., Specialists' Meeting, 1968, Proceedings: Geological Society of Australia Special Publication 2, p. 279-281.

Gower, C. F., and Boejli, J. C., 1977, Rason, W. A.: Geological Survey of Western Australia, 1:250,000 Geological Series--Explanatory Notes, 17 p. -- Includes brief description of layered mafic intrusion in the Archaean greenstone belt. -- J. A. B.

Grapes, R. H., 1975, Petrology of the Blue Mountain complex, Marlborough, New Zealand: Journal of Petrology, v. 16, p. 371-428.

Gray, C. M., 1967, The geology, petrology and geochemistry of the Teizi metanorthosite: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 62 p.

Gray, C. M., Cliff, R. A., and Goode, A. D. T., 1981, Neodymium-strontium isotopic evidence for extreme contamination in a layered basic intrusion: Earth and Planetary Science Letters, v. 56, p. 189-198.

Gray, C. M., and Goode, A. D. T., 1981, Strontium isotope resolution of magma dynamics in a layered intrusion: Nature, v. 294, p. 155-158. -- High initial ratios demonstrate contamination of magma by country rock in the Kalka intrusion, Giles Complex. -- J. A. B.

Green, D. H., 1959, Geology of the Beaconsfield district, including the Andersons Creek ultrabasic complex: Launceston, Tasmania, Queen Victoria Museum Records, new ser. 10, p. 1-25.

Hallberg, J. A., 1970, The petrology and geochemistry of metamorphosed Archaean basic volcanic and related rocks between Coolgardie and Norseman, Western Australia: Nedlands, University of Western Australia, B.Sc. Honours thesis, 191 p.

----- 1972, Geochemistry of Archaean volcanic belts in the Eastern Goldfields region of Western Australia: Journal of Petrology, v. 13, p. 46-56.

Hallberg, J. A., Johnston, C., and Bye, S. M., 1976, The Archaean Marda igneous complex, Western Australia: *Precambrian Research*, v. 3, p. 111-136.

Hallberg, J. A., and Williams, D. A. C., 1972, Archean mafic and ultramafic rock associations in the Eastern Goldfields region, Western Australia: *Earth and Planetary Science Letters*, v. 15, p. 191-200.

Halligan, R., and Harris, J. L., 1980, Bow River Cu-Ni deposit, Halls Creek Province, W.A.: *Journal of Geochemical Exploration*, v. 12, p. 214-217.

Hamlyn, P. R., 1977, Petrology of the Panton and McIntosh layered intrusions, Western Australia, with particular reference to the genesis of the Panton chromite deposits: Melbourne, Victoria, University of Melbourne, Ph.D. thesis, 390 p.

----- 1980, Equilibration history and phase chemistry of the Panton Sill, Western Australia: *American Journal of Science*, v. 280, p. 631-668.

Hamlyn, P. R., and Keays, R. R., 1979, Origin of chromite compositional variation in the Panton Sill, Western Australia: *Contributions to Mineralogy and Petrology*, v. 69, p. 75-82.

Harrison, P. H., 1986, The mineral potential of layered igneous complexes within the Western Gneiss Terrain, in Professional papers for 1984: Geological Survey of Western Australia Report 19, p. 37-54.

Henderson, I., 1985, A study of mineral and compositional variations in an oxide-rich part of the Windimurra Complex, Western Australia: Nedlands, University of Western Australia, B.Sc. Honours thesis, 82 p.

Hickman, A. H., 1981, Crustal evolution of the Pilbara Block, Western Australia, in Glover, J. E., and Groves, D. I., eds., *Archaean geology*: Geological Society of Australia Special Publication 7, p. 57-69.

----- 1983, Geology of the Pilbara Block and its environs: Western Australian Geological Survey Bulletin 127, 268 p. -- Includes brief descriptions and regional setting of layered mafic/ultramafic intrusions in the Pilbara Block (e.g., Munni Munni). -- J. A. B.

Hill, R. E. T., 1985, The Six Mile Well nickel deposit--a layered ultramafic complex, in Ewers, W. E., ed., *Research review 1983*: Canberra, New South Wales, CSIRO Division of Mineralogy, p. 45-47.

Hoatson, D. M., 1984, Potential for platinum-group mineralization in Australia; a review: *Australia Bureau of Mineral Resources Record* 1984/1, 92 p. -- Review of PGE-deposit models and PGE occurrences in Australia, along with possibly associated Cr and V occurrences. Brief descriptions of various layered intrusions throughout Australia. -- J. A. B.

Hockley, J. J., 1971, Occurrence and geological significance of layered stratiform intrusion in the Yilgarn Block, Western Australia: *Nature*, v. 232, p. 252-253. -- Links various magnetite-bearing intrusions (Windimurra, Narndee, Barrambie, Youanmi) into one major intrusion (the Challa Intrusion). Early reference with few hard data. See also Korsch (1971). -- J. A. B.

Jaques, A. L., 1976, An Archean tholeiitic layered sill from Mt Kilkenny, Western Australia: *Geological Society of Australia Journal*, v. 23, p. 157-168.

Jervis, M., 1983, Petrology, chemistry, and petrogenesis of two layered intrusions near Soansville, in the east Pilbara Block, Western Australia: Nedlands, University of Western Australia, B.Sc. Honours thesis, 94 p.

Keays, R. R., and Campbell, I. H., 1981, Precious metals in the Jimberlana Intrusion, Western Australia: Implications for the genesis of platiniferous ores in layered intrusions: *Economic Geology*, v. 76, p. 1118-1141.

King, S. N., 1986, Petrology and structure of the Wagoo Hills section in the Windimurra Layered Complex, Western Australia: Nedlands, University of Western Australia, B.Sc. Honours thesis, 90 p.

Kleeman, J. D., 1964, Studies on the x-ray diffraction, analysis and geochemistry of plagioclase from the Mt. Davies igneous intrusion: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 28 p.

Kleeman, J. D., and Nesbitt, R. W., 1967, X-ray measurements on some plagioclase from the Mt. Davies intrusion, South Australia: *Geological Society of Australia Journal*, v. 14, p. 39-42. -- Part of the Giles Complex. -- J. A. B.

Korsch, R. J., 1971, The occurrence of a stratiform basic intrusion in the Barrambie area, Western Australia: *Search*, v. 2, p. 289-290. -- Name "Barrambie Intrusion" used for several intrusions (Windimurra, Narndee, Barrambie, Youanmi) -- equivalent to Challa Intrusion of Hockley (1971). Compares it with Bushveld, Stillwater, and Skaergaard. Early reference with few hard data. -- J. A. B.

Lang, A. J., 1976, The distribution of uranium between the major phases of the Jimberlana Intrusion, Western Australia: Melbourne, Victoria, University of Melbourne, B.Sc. Honours thesis.

Lewis, J. D., and Williams, I. R., 1973, The petrology of an ultramafic lava near Murphy Well, Eastern Goldfields, Western Australia: *Geological Survey of Western Australia Annual Report*, 1972, p. 60-68.

Mathison, C. I., 1967, The Somerset Dam layered basic intrusion, southeastern Queensland: *Geological Society of Australia Journal*, v. 14, p. 57-86. -- Small circular, saucer-shaped layered intrusion (2 x 3 km and 500 m thick) of Triassic age, consisting of troctolite, olivine gabbro, ferrigabbro, and leucogabbro. -- J. A. B.

----- 1970, The Somerset Dam layered basic intrusion: Brisbane, University of Queensland, Ph.D. thesis, 181 p.

----- 1975, Magnetites and ilmenites in the Somerset Dam layered basic intrusion, southeastern Australia: *Lithos*, v. 8, p. 93-111.

Mathison, C. I., and Hamlyn, P. R., 1987, The McIntosh layered troctolite-olivine gabbro intrusion, East Kimberly, Western Australia: *Journal of Petrology*, v. 28, p. 211-234.

Mathison, C. I., and Marshall, A. E., 1981, Ni-Cu sulfides and their host mafic-ultramafic rocks in the Mt. Scholl intrusion, Pilbara region, Western Australia: *Economic Geology*, v. 76, p. 1581-1596.

- McCall, G. J. H., 1971, Some ultrabasic and basic igneous rock occurrences in the Archaean of Western Australia, in Glover, J. E., ed., Symposium on Archaean Rocks, Perth, 1970, Proceedings: Geological Society of Australia Special Publication 3, p. 429-442. -- Includes brief descriptions of several mafic/ultramafic layered sills in Archaean greenstone belts near Kalgoorlie. -- J. A. B.
- McCall, G. J. H., and Doepel, J. J. G., 1969, Stratiform basic bodies within the Yilmia ophiolites, Western Australia: Australasian Institute of Mining and Metallurgy Proceedings, v. 231, p. 67-73.
- McCall, G. J. H., and Leishman, J., 1971, Clues to the origin of Archaean eugeosynclinal peridotites and the nature of serpentinization, in Glover, J. E., ed., Symposium on Archaean Rocks, Perth, 1970, Proceedings: Geological Society of Australia Special Publication 3, p. 281-299.
- McCall, G. J. H., and Peers, R., 1971, Geology of the Binneringie dyke, Western Australia: Geologische Rundschau, v. 60, p. 1174-1263.
- McCarthy, T. S., and Cawthorn, R. G., 1980, Changes in initial $^{87}\text{Sr}/^{86}\text{Sr}$ ratio during protracted fractionation in igneous complexes: Journal of Petrology, v. 21, p. 245-264.
- McCarthy, T. S., and Groves, D. I., 1979, The Blue Tier Batholith, northeastern Tasmania; a cumulate-like product of fractional crystallization: Contributions to Mineralogy and Petrology, v. 71, p. 193-209.
- McClay, K. R., and Campbell, I. H., 1976, The structure and shape of the Jimberlana Intrusion, Western Australia, as indicated by an investigation of the Bronzite Complex: Geological Magazine, v. 113, p. 129-139.
- Miller, C., 1966, The geochemical study of clinopyroxenes from the igneous intrusion, South Davies, northwestern South Australia: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 28 p.
- Miller, L. J., 1975, The Archaean eugeosyncline of the Pilbara, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 55-63.
- Moeskops, P. G., 1977, New type of igneous layering due to fractionation of Archaean ultramafic magma: Nature, v. 267, p. 508-509.
- Moore, A. C., 1968, Rutile exsolution in orthopyroxene: Contributions to Mineralogy and Petrology, v. 17, p. 233-236. -- From the Giles Complex, central Australia. -- J. A. B.
- 1970, The geology of the Gosse Pile ultramafic intrusion and of the surrounding granulites, Tomkinson Ranges, central Australia: Adelaide, South Australia, University of Adelaide, Ph.D. thesis, 256 p.
- 1971, Some aspects of the geology of the Gosse Pile ultramafic intrusion, central Australia: Geological Society of Australia Journal, v. 18, p. 69-80.
- 1971, The mineralogy of the Gosse Pile ultramafic intrusion, central Australia. I. Plagioclase: Geological Society of Australia Journal, v. 18, p. 115-126.

- Moore, A. C., 1971, The mineralogy of the Gosse Pile ultramafic intrusion, central Australia. II. Pyroxenes: Geological Society of Australia Journal, v. 18, p. 243-258.
- 1973, Studies of igneous and tectonic textures and layering in the rocks of the Gosse Pile intrusion, Central Australia: Journal of Petrology, v. 14, p. 47-79.
- Morgan, W. R., 1982, A layered ultramafic intrusion in Archaean granulites near Lake Kondinin, Western Australia: Royal Society of Western Australia Journal, v. 65, p. 69-85.
- Muhling, P. C., and Low, G. H., 1977, Yalgoo, Western Australia: Geological Survey of Western Australia, 1:250,000 Geological Series--Explanatory Notes, 36 p. -- Includes brief descriptions of layered mafic sills--the Wadgingarra gabbro and the Buddadoo gabbro within Archaean greenstones. Includes analyses of vanadiferous titaniferous magnetite layers. -- J. A. B.
- Murray, C. G., 1968, Ultramafic rocks in the Rockhampton area, in Ellis, P. L., and Murray, C. G., eds., 1968 Field Conference, Rockhampton-Mt Morgan area: Brisbane, Geological Society of Australia, Queensland Division, p. 18-20.
- Myers, J. S., 1985, The Fraser Complex--a major layered intrusion in Western Australia, in Professional papers for 1983: Geological Survey of Western Australia Report 14, p. 57-66.
- Nesbitt, R. W., 1966, The Giles igneous province, central Australia; an example of an eroded volcanic zone: Bulletin of Volcanology, v. 29, p. 271-282. -- Contrast with Goode and Moore (1975), who considered the crystallization of the Giles Complex to have been high-pressure, deep-seated. -- J. A. B.
- Nesbitt, R. W., Goode, A. D. T., Moore, A. C., and Hopwood, T. P., 1970, The Giles Complex, central Australia: A stratified sequence of mafic and ultramafic intrusions, in Visser, D. J. L., and von Gruenewaldt, G., eds., Symposium on the Bushveld Igneous Complex and Other Layered Intrusions, Pretoria, 1969, Papers: Geological Society of South Africa Special Publication 1, p. 547-564.
- Nesbitt, R. W., and Kleeman, A. W., 1964, Layered intrusions of the Giles Complex, central Australia: Nature, v. 203, p. 391-393.
- Nesbitt, R. W., and Talbot, J. L., 1966, The layered basic and ultrabasic intrusives of the Giles Complex, central Australia: Contributions to Mineralogy and Petrology, v. 13, p. 1-11.
- Nevill, M. W., 1974, The geology and mineralization of the Corkwood prospect area, Lamboo complex, East Kimberley, Western Australia: Nedlands, University of Western Australia, B.Sc. Honours thesis, 72 p.
- Palethorpe, C. E., 1972, A geochemical and geotectonic comparison of selected Australian ultramafic associations: Brisbane, University of Queensland, Ph.D. thesis, 300 p.
- Parks, Jennifer, 1983, The geology and geochemistry of the Windimurra Hills section, Windimurra Complex, Western Australia: Nedlands, University of Western Australia, B.Sc. Honours thesis, 99 p.

Parks, Jennifer, and Hill, R. E. T., 1985, The geology of a 2.2 km section of stratigraphy of the Windimurra layered gabbroic intrusion, Yilgarn Block, Western Australia, in Morris, R. C., and others, eds., Research review 1985: Canberra, New South Wales, CSIRO Division of Mineralogy and Geochemistry, p. 75-76.

----- 1985, Phase compositions and cryptic variation in a 2.2 km section of the Windimurra layered gabbroic intrusion, Yilgarn Block, Western Australia, in Morris, R. C., and others, eds., Research review 1985: Canberra, New South Wales, CSIRO Division of Mineralogy and Geochemistry, p. 76-77.

----- 1985, Phase compositions and cryptic variation in a 2.2-km section of the Windimurra layered gabbroic intrusion, Yilgarn Block, Western Australia: A comparison with the Stillwater Complex: Canadian Mineralogist, v.23, p. 310-311.

----- 1985, The geology of a 2.2-km section of the Windimurra layered gabbro, Yilgarn Block, Western Australia: Canadian Mineralogist, v. 23, p. 329.

----- 1986, Phase compositions and cryptic variation in a 2.2-km section of the Windimurra layered gabbroic intrusion, Yilgarn Block, Western Australia--a comparison with the Stillwater Complex: Economic Geology, v. 81, p. 1196-1202.

Plumb, K. A., and Gemuts, I., 1976, Precambrian geology of the Kimberley region, Western Australia: International Geological Congress, 25th, Sydney, 1976, Excursion Guide 44C, 72 p.

Price, R. C., and Wallace, R. C., 1976, The significance of corona textured inclusions from a high pressure fractionated alkalic lava, North Otago, New Zealand: Lithos, v. 9, p. 319-329.

Purvis, A. C., Nesbitt, R. W., and Hallberg, J. A., 1972, The geology of part of the Carr Boyd Rocks complex and its associated nickel mineralization, Western Australia: Economic Geology, v. 67, p. 1093-1113.

Richardson, B. D., 1976, The geology of the Radio Hill layered intrusion: Nedlands, University of Western Australia, B.Sc. Honours thesis, 42 p.

Roeder, P. L., and Campbell, I. H., 1985, The effect of postcumulus reactions on composition of chrome-spinels from the Jimberlana Intrusion: Journal of Petrology, v. 26, p. 763-786.

Rubenach, M. J., 1973, The Tasmanian ultramafic/gabbro and ophiolite complexes: Hobart, University of Tasmania, Ph.D. thesis, 213 p.

----- 1974, The origin and emplacement of the Serpentine Hill Complex, Western Tasmania: Geological Society of Australia Journal, v. 21, p. 91-106.

Schultz, K., 1975, Carr-Boyd Rocks nickel-copper deposits, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 125-128.

Simon, I. K., 1972, A geochemical investigation and petrological investigation of the massive dunite members of the Scotia ultramafic belt: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 42 p.

Smith, P. C., 1970, The geology of the Hinckley Ranges, W. A.: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 28 p.

Steele, R. J., 1966, Gravimetric investigation of the Mt. Davies and the Gosse Pile intrusions of the Giles Complex: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 29 p.

Stewart, A. J., Williams, I. R., and Elias, M., 1983, Youanmi, Western Australia: Geological Survey of Western Australia, 1:250,000 Geological Series--Explanatory Notes, 58 p. -- Includes brief descriptions and geochemical analyses of part of the Windimurra Complex, the Youanmi intrusion, and the Atley intrusion, all of which may be comagmatic. -- J. A. B.

Summons, T. G., Green, D. C., and Everard, J. L., 1981, The occurrence of chromite in the Andersons Creek area, Beaconsfield, Tasmania: Economic Geology, v. 76, p. 505-518.

Thom, J. H., 1975, Kimberley region, in The geology of Western Australia: Geological Survey of Western Australia Memoir 2, p. 160-193.

Thomson, B. P., 1963, Nickel mineralization and the Giles Complex in the Tomkinson Ranges, South Australia: Geological Survey of South Australia Quarterly Geological Notes, no. 8, p. 2-3.

Thornett, J. R., 1981, The Sally Malay deposit: Gabbroid-associated nickel-copper sulfide mineralization in the Halls Creek mobile zone, Western Australia: Economic Geology, v. 76, p. 1565-1580.

Travis, G. A., 1975, Nickel-copper sulphide mineralization in the Jimberlana Intrusion, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Victoria, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 75-78.

Tyrwhitt, D. S., and Orridge, G. R., 1975, Regional geology and mineralization of the Fraser Range orogenic belt, Western Australia, in Knight, C. L., ed., Economic geology of Australia and Papua New Guinea, I. Metals: Parkville, Australasian Institute of Mining and Metallurgy Monograph Series, no. 5, p. 405-408.

Varne, R., and Brown, A. V., 1978, The geology and petrology of the Adamsfield ultramafic complex, Tasmania: Contributions to Mineralogy and Petrology, v. 67, p. 195-207.

Whitfield, G. B., 1973, Geochemistry of alteration of Archaean layered sills in Western Australia: Nedlands, University of Western Australia, M.S. thesis, 115 p.

Wilding, I. G. P., 1980, Corkwood Cu-Ni prospect, Halls Creek Province, W.A.: Journal of Geochemical Exploration, v. 12, p. 220-224.

Wilkinson, J. F. G., Duggan, M. B., Herbert, H. K., and Kalocsai, G. I. Z., 1975, The Salt Lick Creek layered intrusion, East Kimberley region, Western Australia: Contributions to Mineralogy and Petrology, v. 50, p. 1-23.

Williams, D. A. C., 1967, The geology of the Ora Banda norite, Western Australia: Nedlands, University of Western Australia, B.Sc. Honours thesis, 217 p.

Williams, D. A. C., 1971, Determination of primary mineralogy and textures in ultramafic rocks from Mt Monger, Western Australia, in Glover, J. E., ed., Symposium on Archaean Rocks, Perth, 1970, Proceedings: Geological Society of Australia Special Publication 3, p. 259-268.

----- 1972, Archaean ultramafic and associated rocks, Mt. Monger, Western Australia: Nedlands, University of Western Australia, Ph.D. thesis, 225 p.

----- 1972, Archaean ultramafic, mafic, and associated rocks, Mt. Monger, Western Australia: Geological Society of Australia Journal, v. 19, p. 163-188.

Williams, D. A. C., and Hallberg, J. A., 1973, Archaean layered intrusions of the Eastern Goldfields region, Western Australia: Contributions to Mineralogy and Petrology, v. 38, p. 45-70.

Williams, I. R., 1974, Structural subdivision of the Eastern Goldfields province, Yilgarn Block: Geological Survey of Western Australia Annual Report 1973, p. 53-59.

----- 1975, Eastern Goldfields Province, in The geology of Western Australia: Geological Survey of Western Australia Memoir 2, p. 33-54.

Wilson, A. F., 1969, The pyroxene granulites and associated gabbros of the Fraser Range, Western Australia, and their economic significance: Australasian Institute of Mining and Metallurgy Proceedings, no. 231, p. 47-57.

Wilson, M. M., and Mathison, C. I., 1968, The Eulogie Park gabbro, a layered basic intrusion from eastern Queensland: Geological Society of Australia Journal, v. 19, p. 139-158. -- Permian-Triassic intrusion, at least 900 m thick, containing olivine gabbro, ferrigabbro, troctolite, leucogabbro, gabbro, and magnetite-rich rocks. -- J. A. B.

Yong, S. K., 1964, The distribution of trace elements, Ni, Cu, Sr, Cr and Mn in the Mt. Davies basic intrusion of South Australia: Adelaide, South Australia, University of Adelaide, B.Sc. Honours thesis, 57 p.

BIBLIOGRAPHY ON THE DUFEK INTRUSION, ANTARCTICA

Abel, K. D., Himmelberg, G. R., and Ford, A. B., 1979, Petrologic studies of the Dufek intrusion: Plagioclase variation: *Antarctic Journal of the United States*, v. 14, no. 5, p. 6-8.

Aughenbaugh, N. B., 1961, Preliminary report on the geology of the Dufek Massif: *International Geophysical Year World Data Center A, Glaciology Report 4*, p. 155-193.

Beck, M. E., Jr., 1972, Palaeomagnetism and magnetic polarity zones in the Jurassic Dufek intrusion, Pensacola Mountains, Antarctica: *Royal Astronomical Society Geophysical Journal*, v. 28, p. 49-63.

Beck, M. E., Jr., Burmester, R. F., and Sheriff, S. D., 1979, Field reversal and paleomagnetic pole for Jurassic Antarctica: *Eos (American Geophysical Union Transactions)*, v. 60, p. 818.

Beck, M. E., Jr., Ford, A. B., and Boyd, W. W., Jr., 1968, Palaeomagnetism of a stratiform mafic intrusion in the Pensacola Mountains, Antarctica: *Nature*, v. 217, p. 534-535.

Beck, M. E., Jr., and Griffin, N. L., 1971, Magnetic intensities in a differentiated gabbroic body, the Dufek intrusion, Pensacola Mountains, Antarctica, *in* Geological Survey research, 1971: U.S. Geological Survey Professional Paper 750-B, p. B117-B121.

Behrendt, J. C., 1962, Geophysical and glaciological studies in the Filchner ice shelf area in Antarctica: *Journal of Geophysical Research*, v. 67, p. 221-234.

----- 1971, Interpretation of geophysical data in the Pensacola Mountains, Antarctica: *Antarctic Journal of the United States*, v. 6, no. 5, p. 196-197.

----- 1983, Dufek intrusion (Jurassic) provides constraint on the tectonics of west Antarctica: *Geological Society of America Abstracts with Programs*, v. 15, p. 524.

Behrendt, J. C., Drewry, D. J., Jankowski, Edward, and England, A. W., 1979, Revision of known area of Dufek intrusion: *Antarctic Journal of the United States*, v. 14, no. 5, p. 6.

Behrendt, J. C., Drewry, D. J., Jankowski, Edward, and Grim, M. S., 1980, Aeromagnetic and radio echo ice-sounding measurements show much greater area of the Dufek intrusion, Antarctica: *Science*, v. 209, p. 1014-1017.

----- 1981, Aeromagnetic and radio echo ice-sounding measurements over the Dufek intrusion, Antarctica: *Journal of Geophysical Research*, v. 86, p. 3014-3020.

Behrendt, J. C., Henderson, J. R., Meister, Laurent, and Rambo, W. L., 1974, Geophysical investigations of the Pensacola Mountains and adjacent glacierized areas of Antarctica: U.S. Geological Survey Professional Paper 844, 28 p.

Behrendt, J. C., Meister, Laurent, Henderson, J. R., 1966, Airborne geophysical study in the Pensacola Mountains, Antarctica: Science, v. 153, p. 1373-1376.

Behrendt, J. C., Rambo, W. L., Henderson, J. R., Wanous, R. E., and Meister, Laurent, 1973, Simple Bouguer gravity and aeromagnetic maps of the Davis Valley quadrangle and part of the Cordiner Peaks quadrangle and vicinity, Antarctica: U.S. Geological Survey Geophysical Investigations Map GP-887, scale 1:250,000.

----- 1973, Simple Bouguer gravity and aeromagnetic maps of the Saratoga Table quadrangle, Antarctica: U.S. Geological Survey Geophysical Investigations Map GP-888, scale 1:250,000.

Burmester, R. F., and Beck, M. E., Jr., 1981, Paleomagnetism of the Dufek intrusion: Antarctic Journal of the United States, v. 16, no. 5, p. 58-60.

Burmester, R. F., and Sheriff, S. D., 1980, Paleomagnetism of the Dufek intrusion, Pensacola Mountains: Antarctic Journal of the United States, v. 15, no. 5, p. 43-45.

de Wit, M. J., 1985, Minerals and mining in Antarctica: Science and technology, economics and politics: Oxford, Clarendon Press, 127 p.

Drinkwater, J. L., Ford, A. B., and Czamanske, G. K., 1985, Study of sulfide mineral distribution in the Dufek intrusion: Antarctic Journal of the United States, v. 19, no. 5, p. 50-51.

----- 1986, Apatites of the Dufek intrusion, a preliminary study: Antarctic Journal of the United States, v. 20, no. 5.

England, A. W., Cooke, J. E., Hodge, S. M., and Watts, R. D., 1979, Geophysical investigations of Dufek intrusion, Pensacola Mountains: Antarctic Journal of the United States, v. 14, no. 5, p. 4-5.

England, A. W., and Nelson, W. H., 1977, Geophysical studies of the Dufek intrusion, Pensacola Mountains, 1976-1977: Antarctic Journal of the United States, v. 12, no. 4, p. 93-94.

Ford, A. B., 1968, Origin of microfractures and joints in the Dufek intrusion, Antarctica, in Abstracts for 1968: Geological Society of America Special Paper 115, p. 69.

----- 1970, Development of the layered series and capping granophyre of the Dufek intrusion of Antarctica, in Visser, D. J. L., and von Gruenewaldt, G., eds., Symposium on the Bushveld Igneous Complex and Other Layered Intrusions, Pretoria, 1969, Papers: Geological Society of South Africa Special Publication 1, p. 492-510.

----- 1972, The Weddell orogeny--latest Permian to early Mesozoic deformation at the Weddell Sea margin of the Transantarctic Mountains, in Adie, R. J., ed., Antarctic geology and geophysics: Oslo, Universitetsforlaget, p. 419-425.

----- 1974, Basalt dikes of the Cordiner Peaks; satellitic bodies of the Dufek intrusion?: Antarctic Journal of the United States, v. 9, no. 4, p. 149-152.

Ford, A. B., 1975, Stratigraphy and whole-rock chemical variation in the stratiform Dufek intrusion, Pensacola Mountains, Antarctica: Geological Society of America Abstracts with Programs, v. 7, p. 1075-1076.

----- 1976, Stratigraphy of the layered gabbroic Dufek intrusion, Antarctica: U.S. Geological Survey Bulletin 1405-D, 36 p.

----- 1983, Minor-metal reconnaissance survey related to possible resources in the Dufek intrusion: Antarctic Journal of the United States, v. 18, no. 5, p. 4-6.

----- 1983, The Dufek intrusion of Antarctica and a survey of its minor metals related to possible resources, in Behrendt, J. A., ed., Petroleum and mineral resources of Antarctica: U.S. Geological Survey Circular 909, p. 51-75.

Ford, A. B., and Boyd, W. W., Jr., 1968, The Dufek intrusion, a major stratiform gabbroic body in the Pensacola Mountains, Antarctica: International Geological Congress, 23rd, Prague, 1968, Proceedings, v. 2, p. 213-228.

----- 1969, Chemical trends in the Dufek intrusion: Antarctic Journal of the United States, v. 4, no. 5, p. 202-203.

Ford, A. B., Carlson, Christine, Czamanske, G. K., Nelson, W. H., and Nutt, C. J., 1977, Geological studies of the Dufek intrusion, Pensacola Mountains, 1976-1977: Antarctic Journal of the United States, v. 12, no. 4, p. 90-92.

Ford, A. B., and Himmelberg, G. R., 1982, Magma-chamber replenishment in the Dufek intrusion, Antarctica: Geological Society of America Abstracts with Programs, v. 14, p. 490.

----- in press, Geology and crystallization of the Dufek intrusion, in Tingey, R. J., ed., Geology of Antarctica: Oxford, U.K., Oxford University Press.

Ford, A. B., Himmelberg, G. R., and Drinkwater, J. L., 1980, Dufek intrusion and plagioclase problems: Antarctic Journal of the United States, v. 15, p. 40-42.

Ford, A. B., and Kistler, R. W., 1980, K-Ar age, composition, and origin of Mesozoic mafic rocks related to the Ferrar Group in the Pensacola Mountains, Antarctica: New Zealand Journal of Geology and Geophysics, v. 23, p. 371-390.

Ford, A. B., Kistler, R. W., and White, L. D., 1986, Strontium and isotopic study of the Dufek intrusion: Antarctic Journal of the United States, v. 20, no. 5.

Ford, A. B., Mays, R. E., Haffty, Joseph, and Fabbi, B. P., 1983, Reconnaissance of minor metal abundances and possible resources of the Dufek intrusion, Pensacola Mountains (Antarctica), in Oliver, R. L., James, J. R., and Jago, J. B., eds., Antarctic earth science: Canberra, Australian Academy of Science, p. 433-436.

Ford, A. B., and Nelson, S. W., 1972, Density of the stratiform Dufek intrusion, Pensacola Mountains, Antarctica: Antarctic Journal of the United States, v. 7, no. 5, p. 147-149.

Ford, A. B., Reynolds, R. L., Huie, Carl, and Boyer, S. J., 1979, Geologic field investigation of Dufek intrusion: Antarctic Journal of the United States, v. 14, no. 5, p. 9-11.

Ford, A. B., Schmidt, D. L., and Boyd, W. W., Jr., 1978, Geologic map of the Davis Valley quadrangle and part of the Cordiner Peaks quadrangle, Pensacola Mountains, Antarctica: U.S. Geological Survey Antarctic Geologic Map A-10, scale 1:250,000.

Ford, A. B., Schmidt, D. L., Boyd, W. W., Jr., and Nelson, W. H., 1978, Geologic map of the Saratoga Table quadrangle, Pensacola Mountains, Antarctica: U.S. Geological Survey Antarctic Geologic Map A-9, scale 1:250,000.

Griffin, N. L., 1969, Paleomagnetic properties of the Dufek intrusion, Antarctica: Riverside, University of California, M.S. thesis, 93 p.

Gunn, B. M., 1963, Layered intrusions in the Ferrar dolerites, Antarctica, in Fisher, D. J., Frueh, A. J., Jr., Hurlbut, C. S., Jr., and Tilley, C. E., eds., International Mineralogical Association General Meeting, 3rd, Washington, 1962, Papers and Proceedings: Mineralogical Society of America Special Paper 1, p. 124-133.

Haensel, J. M., Jr., Himmelberg, G. R., and Ford, A. B., 1986, Plagioclase compositional variations in anorthosites of the lower part of the Dufek intrusion: Antarctic Journal of the United States, v. 20, no. 5.

Hall, S. H., and Bailey, S. W., 1976, Amesite from Antarctica: American Mineralogist, v. 61, p. 497-499

Himmelberg, G. R., and Ford, A. B., 1973, Pyroxene compositional trends in the Dufek intrusion, Pensacola Mountains: Antarctic Journal of the United States, v. 8, no. 5, p. 260-263.

----- 1975, Petrologic studies of the Dufek intrusion, Pensacola Mountains; iron-titanium oxides: Antarctic Journal of the United States, no. 5, v. 10, p. 241-244.

----- 1975, Pyroxene compositional trends in the stratiform Dufek intrusion, Antarctica: Geological Society of America Abstracts with Programs, v. 7, p. 1117.

----- 1976, Pyroxenes of the Dufek intrusion, Antarctica: Journal of Petrology, v. 17, p. 219-243.

----- 1977, Iron-titanium oxides of the Dufek intrusion, Antarctica: American Mineralogist, v. 62, p. 623-633.

----- 1983, Composite inclusion of olivine gabbro and calc-silicate rock in the Dufek intrusion, a possible fragment of a concealed contact zone: Antarctic Journal of the United States, v. 18, no. 5, p. 1-4.

Kyle, P. R., Elliot, D. H., and Sutter, J. F., 1981, Jurassic Ferrar Supergroup tholeiites from the Transantarctic Mountains, Antarctica, and their relationship to the initial fragmentation of Gondwana, in Cresswell, M. M., and Vella, P., eds., Gondwana Five: Rotterdam, A. A. Balkema, p 283-287.

Neuburg, H. A. C., Thiel, Edward, Walker, P. T., Behrendt, J. C., and Aughenbaugh, N. B., 1959, The Filchner ice shelf: Association of American Geographers Annals, v. 49, no. 2, p. 110-119.

Parker, B. C., Ford, A. B., Allnutt, T., Bishop, B., and Wendt, S., 1977, Baseline microbiological data for soils of the Dufek Massif: Antarctic Journal of the United States, v. 12, no. 4, p. 24-26.

Rowley, P. D., Ford, A. B., Williams, P. L., and Pride, D. E., 1983, Metallogenic provinces in Antarctica, in Oliver, R. L., James, P. R., and Jago, J. B., eds., Antarctic earth science: Canberra, Australian Academy of Science, p. 414-419.

Schmidt, D. L., and Ford, A. B., 1969, Geology of the Pensacola and Thiel Mountains, pl. 5 of Bushnell, V. C., and Craddock, C., eds., Geologic maps of Antarctica: New York, American Geographical Society, scale 1:1,000,000.

Shapley, Deborah, 1986, The seventh continent: Antarctica in a resource age: Washington, D.C., Resources for the Future, Inc., 332 p.

Walker, P. T., 1961, Study of some rocks and minerals from the Dufek Massif, Antarctica: International Geophysical Year World Data Center A, Glaciology Report 4, p. 195-213.

Wright, N. A., and Williams, P. L., 1974, Mineral resources of Antarctica: U.S. Geological Survey Circular 705, 29 p.

Zumberge, J. H., 1979, Mineral resources and geopolitics in Antarctica: American Scientist, v. 67, p. 68-77.